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Subject
or
Title.

Strategic Studies in the Gulf of Mexico,
Caribbean Sea and Pacific Ocean.

Lectures by St. Louis Stockton,
U.S.Navy.

1888

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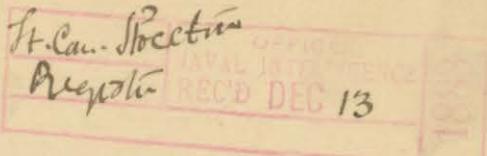
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Register No. 8310



Office of NAVAL INTELLIGENCE

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Lecture No. 2

MILITARY AND COMMERCIAL EXAMINATION

of the

PORTS AND COUNTRIES

of the

GULF OF MEXICO AND CARIBBEAN SEA

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Part First:

Florida Straits to Chiriqui Lagoon

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Charts:

Key West, Havana, Pensacola,

Capt

The Passes of the Mississippi, Chirique Lagoon.

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Lecture No. 2.

General Examination of the Gulf of Mexico, West Indies &c.

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The coasts and ports to be discussed in this and the following lecture will be those of sufficient importance that are found upon the Gulf of Mexico, the Florida Straits, the Yucatan Channel and the Caribbean Sea, including the islands generally known under the name of the West Indies.

The more important islands of the West Indies belonging to European powers are in number forty, not counting the Bahamas; and are divided politically as follows:- Belonging to the English, nineteen; to the French, seven; to the Dutch, six; to the Spanish, five; and to the Danish, three.

The number of islands, held by each power, does not of course represent the relative value of its possessions - the Spanish West Indies, in this respect coming first, comprising as it does the magnificent islands of Cuba and Porto Rico, which are the greatest of all West Indian possessions in territorial space and population, as well as in agricultural, commercial and mineral wealth. The English come next only, though the number of islands held under their flag is so much the greater. The French follow the English in the value and importance of their colonies, then the Dutch and finally the Danish.

Prefacing our examination with the statement that the Gulf of Mexico from its situation can be considered as but the outer basin of the Mississippi river and its tributaries, in order that the real value of the Florida Straits and the

Yucatan Channel may be duly appreciated, it then follows that these passages and not the passes of the Mississippi are the real mouths of that river, and by these outlets only, can the products carried on this great water route reach the open sea. It is well also to note that neither of these passages are placed so as to be dominated by the United States to whom they are of so great moment.

The Florida Straits besides being the outlet of that part of our Gulf and Mississippi trade that is bound to the northward and eastward, is also the outlet of the trade from the port of Havana and the northern Cuban ports adjacent thereto, and is used to a considerable extent as a homeward route from the Isthmus of Panama and the west coast of Central America.

On the Florida coast of these straits, north of Key West there are a few anchorages for large vessels, among the coral reefs. The best of these is known as Turtle Harbor which can take vessels drawing up to twenty-four feet. These anchorages are two miles outside the coast cays which in turn border on the mainland at a distance varying from three to eight miles.

On the East side of the Straits lie the Bahamas; the only navigable channels to and through them, from the straits, being the N. W. and S. E. Providence Channels which join at Hole-in-the-Wall. This passage is used frequently by vessels bound south from northern European ports; entering the Florida Straits some distance to the southward of its northern entrance and avoiding for that distance the full strength of the Gulf Stream. Nassau, the principal port of the Bahamas, lies a short distance out of this passage, about fifty miles south of the Hole-in-the-Wall. Its harbor is a poor one and

only vessels drawing thirteen feet or less can cross the bar. The defenses are old and weak and the garrison small. About four hundred small fishing craft belong to this port which might be useful under certain contingencies.

Cochrane Anchorage, about eight miles east of Nassau Harbor with which it is connected by a channel of eleven feet in depth, can take vessels drawing twenty feet and less; the entrances being through reefs navigable to a stranger when buoyed without a pilot.

Nassau and Cochrane Anchorage could serve as a base of hostile operations for light draught vessels and cruisers only against our Florida coast and cays.

The ports of the Gulf coast of the United States that we will examine will be with the view of showing the advantages and disadvantages they may possess as locations for the naval station in the Gulf which is important now but whose necessities will be so great when the canal is built.

The Chief of the Bureau of Yards and Docks says in his last report:

"The necessity for a naval station upon the shores of the Gulf, properly equipped, is imperative for the future, not only from the possibilities likely soon to arise in these waters and the adjoining West Indian countries and seas, but also because a station is needed as a base for the naval defense of our own coasts and the protection of the outlets of our Gulf and Mississippi trade. England, France, and Spain have naval stations upon adjacent islands, and at Martinique, a French island not far distant, is the only dock capable of taking a vessel of over 4,000 tons south of Norfolk and Bermuda along the North American coast."

(Map of Key West.)

The only port of the United States upon Florida Straits having any naval or commercial importance is Key West situated upon the island of that name and having a population of 12,000. By the deepest channel 30 feet can be carried to Fort Taylor, a point which may be said to mark the beginning of the

harbor proper. To reach the same point by the main ship channel the least depth of water is 28.5 feet. Inside this harbor 22 feet of water may be carried to the wharf of the naval station. The rise and fall of tide is 1.4 feet. There is a restricted anchorage off the town in depth varying from 20 to 30 feet and ample space and depth off Fort Taylor for large vessels. A narrow anchorage or mooring ground is found beyond the town known as Man-of-War Harbor, which is a mile long, 400 yards wide, and with least depth of 21 feet. Here the monitors stationed at Key West some years ago were anchored and vessels of moderate size can be moored. The holding ground at Key West is only fair, the protection from sea good and from winds indifferent; cyclones aside, the strongest winds are northerly.

The north-west channel leading from the harbor directly into the Gulf of Mexico has from 7 to 11 feet at low water; efforts have been made to deepen this channel permanently to 17 feet but so far without any success. At times the depth is reduced in this channel that vessels ordinarily using it are obliged to make the detour of 100 miles to reach the town. The latest plan to accomplish this is to build a break-water of stone on west side of channel and blast a ledge of rocks. Estimated cost, \$600,000.

The town of Key West, being situated upon a small island of no natural resources, at a distance in the most direct line (and this is practicable one only for small vessels) of 130 miles from the nearest railroad terminus on the main land; is of but very moderate commercial importance. The industries are those of wrecking, sponge and other fisheries, and cigar manufacture. It is from its position and telegraph facilities used as a port of call for orders and for coaling for passing

vessels, as well as a way port for vessels bound to Galveston, New Orleans and the ports of the main land of Florida. Its principal import is raw tobacco from Cuba. As a coaling station, Key West is of great importance; its geographical position on the Florida Straits, opposite the island of Cuba, and especially the great port of Havana, makes it a very essential position in connection with the trade of the Gulf and the commerce of the West Indies and Central America. Being placed on one of the great highways of trade, its possession to us is of the highest importance. In connection with the Dry Tortugas it forms a naval base, natural and advanced, for operations any offensive or defensive in relation to Havana, the island of Cuba, the Bahamas, or the West Indies in general; in addition it affords a rendezvous and coaling and refitting station for vessels engaged in protecting both of the great outlets of the Mississippi and the Gulf and the eastern part of the Gulf of Mexico. Hence the holding of it by proper shore and floating defenses may be termed a military necessity.

To make it defensible (the practicability of which has been seriously debated) will cost a large sum of money, according to the recommendation of the Endicott Board, of a system of turreted forts, barbette and mortar batteries, submarine mines and torpedo boats. It is difficult even then to protect the island, or the shipping in the harbor from being shelled, and to this we have added the further disadvantages of scarcity of good water, of occasional severe visitations of yellow fever, insular position and consequent liability to be cut off from all communications, and finally absence of material and skilled labor.

It is when securely held a difficult place to blockade at

the same time being easy of access for a friendly vessel seeking refuge.

The great advantages, however, are those of position, strategical and geographical, which emphasize its importance in peace and war. The facilities here should be extended both by the means of docking appliances and the increase of battery.

The Dry Tortugas are distant about 60 miles from Key West, and placed at the Gulf entrances to the Florida Straits. These cays are gouged so as to form a deep and commodious harbor, protected from the sea. This harbor is defended by Fort Jefferson on Garden Key, a large fort of obsolete type and no longer garrisoned. If this harbor should fall into the possession of the enemy, it would form a base and rendezvous for vessels engaged in hostile naval operations against the trade and the ports of the Gulf coast of the United States. The natural resources presented would be a good anchorage, a place for the storage of material, and for the erection of work shops and a rendezvous for large vessels. The depth of water in the channel and harbor is 7 fathoms.

On the west coast of Florida the only port whose natural advantages make it worthy of our notice is Tampa bay. As a harbor of size and considerable depth, the nearest of importance on the main land to Cuba and the West Indies, and as, until recently, the most southerly railroad terminus on the east side of the Gulf it may become in time of war of local strategic importance and in connection with Charlotte Harbor a base of supplies for the Dry Tortugas and port of Key West.

Commercially, Tampa is as yet of little importance. Twenty-one feet of water is found on the bar and up the bay, a

distance of twenty-five miles, and the anchorage ground is ample and well protected. The water, however, at the head and along the shores of the bay is shallow, so much so that the anchorage for large vessels is ten miles from the head of the bay where the town is situated.

(Show chart of Pensacola Bay)

The town of Pensacola with a population of 8000, is situated on Pensacola Bay at a distance of 8 miles from the sea and is the seat of an extensive lumber trade and has fair railroad communications north, east and west. The bay affords a fine anchorage for almost an unlimited number of vessels, and as the site of the only navy yard on the Gulf, would become a very important point in any naval operations undertaken by the United States in the Gulf of Mexico, Caribbean Sea or vicinity of the proposed interoceanic canal. It has in the past, both in the Mexican war and the late war proved its great value and even necessity.

Besides the railroad facilities now existing and proposed there are means of water communication afforded with this bay which might become most important; light draught vessels can penetrate now some distance into the interior by the Escambia, Blackwater and Yellow rivers; and by Santa Rosa Sound communication exists with the inland waters to the eastward.

The depth of water over the bar at the entrance of the bay, before the commencement of the works of improvement now in progress, was 19.7 feet at mean low water and 21.2 feet at ^(?) 22.5 mean high water. The Engineer in charge of the works in his last printed report states that a channel has been obtained 120 feet wide and 24 feet depth, which subsequently shoaled to

23 feet at L. W. The object aimed at is a channel 300 feet wide and 24 feet in depth.

"4. Pensacola Harbor, Florida. - The plan of improvement adopted in 1881, contemplates dredging a channel 300 feet wide and 24 feet deep at mean low water across the inner bar, for the temporary relief of the navigation of this harbor, and the preservation of the site of old Fort McRee, by the construction of suitable works of shore protection, with a view to retaining this position for defensive purposes, and preventing further changes in the tidal currents through the continued abrasion of the shore at this point.

"The expenditure up to June 30, 1887, of \$203,574.97 has resulted in obtaining, temporarily, a channel of 120 feet in width and 24 feet in depth at mean low water across the shoal inside the bar, and in stopping the abrasion of the shoreline at Fort McRee. This channel was not maintained by the tidal currents, and on June 30, 1887, was reported to be about 22 feet in depth at mean low water, a diminution of 1 foot in depth during the past year and a gain of only 2.6 feet over the depth existing when the work was commenced.

"An annual outlay will be necessary to maintain this dredged channel until the permanent improvement of this harbor shall have been authorized by Congress. The works of shore protection at the site of Fort McRee have been successful in stopping abrasion of the beach, advancing it 250 feet on the south side of the south jetty at this point, and advancing the 12, 18 and 24 foot curves of the western channel slopes fronting the shore line at the same place."

"U. S. S. Galena, (3rd Rate)

"New London, Conn.

"July 9th, 1888.

"Rear Admiral

"S. B. Luce, U. S. Navy,
Commanding U. S. Naval Forces,
"North Atlantic Station.

"Sir:

"Referring to the letter of Lieut. Commander Stockton of the 24th ult., and your instructions for me to furnish the information desired by him, I beg leave to report as follows:

"The entrance to Pensacola Harbor has a channel said to be dredged to 24 feet at mean low water. Like most of the Southern Harbors having large tidal basins, this bar is subject to changes proportionate to the forces producing them. It is evident, that as the area of the cross section at the Harbor's mouth is increased above the normal, the more rapidly will the filling process take place, and it is believed that now after one years time from the cessation of dredging, the channel has been reduced to about 23 feet of water. This will represent the greatest draught that can be taken in at mean low water, and favorable circumstances, to which may be added a small allowance depending upon the stage of the tide. Ordinarily, however, a greater allowance must be made for the state of the weather. Southerly winds bring in a sea from the Gulf, which will materially reduce the draught which may be safely entered, and the danger will be as great on the outer bar in 26 and 27 feet of water, as in the dredged

"channel in 23 and 24 feet depth. For in the former locality, "the vessel is in a line with the general direction of the "sea, while in the latter, she is at a greater, or less angle to it.

"On April 28th, when the Squadron attempted to pass out, "the Pilots declared it impracticable to take out a vessel of "over 16 feet draught, although there was 23 or 24 feet of "water in the channel. The Galena, drawing 18' 2" at this "time, slightly touched in 21 feet water by hugging Red No. 6 "rather closely in endeavoring to avoid being set below the "midchannel range by the ebb tide. The Ossipee, with about "the same draught, was enabled to avoid the end of the spit, "which has considerably shoaled since dredging stopped, by "noticing the change in the Galena's course. The Atlanta "two days later, as I understand with about the same water on "the Bar, but a little less sea, struck bottom in mid channel, "drawing 20 feet, 5 inches. On the same day the Galena left "Pensacola, the Pilot who came up to offer his services outside of Mobile Bar, said he would not take in more than 18 "feet draught, notwithstanding we could enter with a following "sea, which would be more favorable to the ship than if passing out of the Bay. He acknowledged there was 23 feet on "the Bar. The Galena and Ossipee crossed at this time in "safety, finding about 24 feet water.

"It must be remembered that the Pilots in allowing from "5 to 7 feet for the rise and fall of the ship in a sea way, "are generally dealing with shorter vessels than ours, and I "should conclude that an allowance of from 3 to 5 feet would "be a safer rule for a man-of-war.

"In other words, men-of-war over 18 feet draught of water, should cross either of these Bars on which there is "about the same depth of water with caution.

"Very respectfully,

"your obedient servant,

(Signed) "C. M. Chester,

"Commander, U.S. Navy,

"Commanding."

The plan pursued was for temporary relief - a permanent plan being not yet authorized.

Pensacola bay inside the bar is 20 miles long and from 3 to 5 miles in width with a depth of water of 5 fathoms up to the anchorage off the town. The protection afforded and the holding ground are both fair in the lower bay and good off the town.

Pensacola bay is but 38 miles from Mobile bay and 125 miles from the South pass of the Mississippi river, and hence is placed at a convenient distance with respect to a naval defense of Mobile bay, the mouths of the Mississippi, or the

other water approaches to the great city of New Orleans. It is by existing rail routes 259 miles from Birmingham, Ala., and its coal and iron regions. The climate is mild and generally healthy, though subject to occasional visitations of yellow fever.

The resources of the port for repairs and supplies are now principally confined to those offered by the Navy Yard, and a small floating dock at Bagdad up the Blackwater river. Supplies of fresh and other provisions can be readily obtained at the town.

There is ample anchorage in the bay, with abundance of water front and no likelihood of any crowding from commercial interests. The present site of the Navy Yard, however, is radically defective from its proximity to the sea, and consequently its untenable position in case of a hostile attack, and objectionable from the exposure to a heavy swell in a gale from the southward. Reference to the chart shows that attacking vessels outside at a distance of two miles from Fort Pickens will be within two miles of the Navy Yard. An excellent position for attack four miles from Fort Pickens and behind sand bluffs on Santa Rosa Island affords an open range of only a little more than three miles to the Navy Yard.

The Navy Yard should be moved to a proper and defensible position either on this bay or elsewhere, and as the use and development of existing unfinished docking facilities may be considered impracticable, except at great expense, an excavated dry dock should be there constructed and proper facilities for repair, fitting out, and eventually construction be established.

Mobile bay, 38 miles westward of Pensacola has a bar on its entrance on which 21 (L. W.) feet can be found. Some distance beyond this bar and leading to the city of Mobile is a narrow dredged channel, staked, and with a depth of 17 feet at high water and a length of 26 miles. There is an anchorage space just inside the bar from which the city is distant 30 miles. There exists no anchorage space of depth or size off the city. Mobile may be now considered the port of the Alabama coal and iron regions, and it has also very considerable trade in cotton and lumber. The docking facilities are poor.

There exists an interior water communication between Mobile and New Orleans for light draught vessels by the way of Mississippi Sound and Lake Ponchatrain. If an enemy has possession of Ship island and its anchorage this route can be controlled and intercepted. Ship island has been noted in the past as a rendezvous and base of operations against New Orleans. Extensive space for vessels in 20 feet of water is afforded by this anchorage to the northward and westward of the island. An unfinished ^{fort} spot, begun in 1862, is its only defense. Ship island might prove of use in any operations protecting or attacking either the passes of the Mississippi; the available landing places near New Orleans, or any port in the northeastern part of the Gulf.

New Orleans and the Passes of the Mississippi.

The Mississippi river since the deepening of its mouth at the South Pass has had its value as a water route greatly increased. The approach of the center of gravity of the population of the United States to a point in the Mississippi

Mississippi and Ohio rivers and their principal tributaries.

New Orleans, the great port of the river, with a population of 216,000, the fifth port in the country in its trade imports and second in its exports, is the point around which all this great trade clusters and from its position may be said to be the key to the lower Mississippi.. The inner defense of the Mississippi naturally centers in this city and in the mouth of the river. The outer defense, as suggested before, includes the command of the Gulf of Mexico and its two outlets.

The principal entrance to the river of late years has been the South Pass; it is 10 miles in length - its condition and depth can be best given by quoting the words of the officer of U. S. Engineers who has been on duty as Inspector there.

Inspecting officer, Maj. W. H. Huer, Corps of Engineers, in 1887, states:

"---that with the exception of three days during the month of March, 1887, when there was some temporary shoaling in the pass, about 1 3/8 miles below its head, there has been throughout the fiscal year a channel from the river into the jetties having a navigable depth of 26 feet. Between the jetties and out to deeper water in the Gulf there has been during the entire year a 26-feet deep channel, not less than 200 feet wide at bottom, containing a 30-foot deep channel of variable width. No dredging has been done in the jetties or pass or vicinity since February, 1883.

"The most important and beneficial change that has occurred during the year, is, that a good, straight channel was secured in October, 1886, in the prolongation of the axis of the jetties, probably caused by the completion of the inner jetties and a long period of high water with rapid current in the river, which produced a scour and widened and deepened what had been a very unsatisfactory channel. This new channel is 210 feet wide, 26 feet deep; it has a central depth of 30 feet, which is 60 feet wide at its narrowest place."

During the year 1885 the total number of vessels reported as passing out to sea was 733 - 37 of these drew 23 feet and more - 11 drew 24 feet or more- and the greatest draught pas-

sing out was 24 1/2 feet.

From the head of the passes inside to off the city of New Orleans the depth of the river is great enough for the largest vessels afloat - Off the city the depth ranges from 60 to 200 feet. All who have anchored off this city are fully aware of the tenacious quality of the holding ground of soft mud. The river at this place averages a half mile in width and from the nature of the bend there, the available water front of the city stretches for over a distance of nine miles.

The built up portion of the city extends almost to Lake Ponchatrain, from which body of water canals for small craft inter into the heart of the city.

The current of the river runs at the rate of 3 to 4 miles an hour during high water. Along the commercial front of the city this current deposits mud in such quantities as to extend the shore slowly but steadily into the harbor. It is stated that an advance of 1,500 feet has been made in the last 150 years. Off the city the annual rise and fall of the river averages twelve feet, the maximum sixteen feet.

As the site of a Naval Station, New Orleans would present all the advantages of a situation on the greatest of our rivers, communicating, as I have said before, with the interior of the Continent and with all its mineral and agricultural wealth within easy reach most of the year.

The fresh water of the river would be of service in keeping clean the bottoms of unsheathed vessels, and the depth of water at the entrance at South Pass is deeper than that at any other part of the Gulf, excepting Key West. Furthermore, New Orleans is capable of a good defense. Floating docks

for vessels having a tonnage up to 3000 now exist and these with the repairing facilities afforded by several establishments, to ships and machinery may be counted as among the naval resources of this port.

And now for the disadvantages - They are , first, its want of accessibility from the sea, a distance of over 100 miles against a strong current having to be passed before the city is reached. This would be felt in a partially or totally disabled vessel, especially in the jetties.

Second.- As the jetties have not established themselves as a permanent success the present depth of the water may not be maintained. The scour of the river and the depth of the channel even now varies considerably anf the formation of the lumps and banks outside the jetties has at times reduced the practicable draught for vessels.

Third.- The narrow channel for over ten miles, in the nature of a canal, in the pass and jetties, may be easily blocked by the grounding or sinking of a vessel causing serious and vexatious delay.

Fourth.- The character of the ground about New Orleans is unfavorable for the construction of deep dry docks, wet basins, or large structures along the river front. The encroachments upon one side and the filling in on the other make the shore line uncertain, and the question of levees a troublesome one.

After an examination of the entire Gulf coast and Florida says it appears to me that Key West should be kept up as an efficient coaling and provision station with some facilities for repairs, but that Pensacola bay should be made the great naval port and dock-yard of the Gulf, the site of the Navy

Yard being changed to a point further up the bay. The character of the ground is suitable for the construction of excavated dry-docks. Pensacola is situated about the central position on the north coast of the Gulf between Florida strait and the Yucatan channel being in the vicinity of 500 miles from each of these passages. It is also at a reasonably short distance from the coal and iron regions being more accessible to it than either Key West or New Orleans, its greatest rivals for a large Naval Station.

The Gulf coast of Mexico from the Rio Grande to Cape Ca-toche, a distance of 1,100 miles, is in the nature of a great bight removed from the trade routes of the Gulf of Mexico, likely to be used to and from the interoceanic canals as now proposed. It is so devoid of shelter that only one harbor - that of Vera Cruz - presents itself of sufficient depth to receive vessels of 18 feet draught of water. It is also subject to severe gales known as northers which at seasons of the year make an anchorage off the coast hazardous.

We find that Matanzas is almost directly opposite Key West and at a distance of 85 miles. It is a large and important city with a fairly good harbor and in connection with Havana 52 miles to the westward would most likely be used in any aggressive warfare against the American trade passing through the Florida Straits

(Chart of Havana and its adjacent coast.)

The port of Havana is the only strongly fortified naval and military port on the Florida Straits or in the Gulf of Mexico in the possession of a European power. It is one of the great commercial cities of the world and it is the great stronghold of Spain in the West Indies and America. ✓

It is of importance in connection with the trans-isthmian canal as it would threaten if not command the Yucatan channel as well as the Florida Straits.

From its size, strength and geographical position it would be the base, in America, of any military or naval operations on the part of Spain against the trade or territory of the United States. In a war with Spain (never an impossible thing) its capture or complete isolation by blockade would be a matter of the very first importance to us in order to protect great loss, the utter paralysis of the Gulf trade and consequently the virtual closing of our Southern ports.

Centering as everything does under Spanish rule in the capital city, the capture of Havana in turn would cause the cessation of any important operations on the part of Spain and would necessitate and result in the virtual political and military domination of the island of Cuba.

This port outranks any other commercial port in the West Indies and is as well the largest city, having a population of over 200,000, nearly the same as that of New Orleans.

The coast outside the entrance of the harbor is clean, deep and can be easily approached. The entrance itself is very narrow but with a depth of from 7 to 9 fathoms - for half a mile it is not more than a cable's length in width - then widening out it soon opens into a fine large basin of irregular shape over two miles long and a width varying from 1/2 to 1 mile. Vessels lie alongside the wharves of the city and at various other points in the harbor. In general terms the harbor is said to have a capacity for 1000 large vessels well moored. It has a good holding ground and is well protected against every thing but hurricanes. The harbor is

less healthy than the city there being no regular tidal or other currents to periodically and freely change the water.

Havana is the general supply depot for Cuba, the imports consisting generally of provisions, lumber, agricultural implements, rice, liquors, coal and oil, and amounting in value to the neighborhood of 50,000,000 dollars. The exports are valued at a sum of over 30,000,000 one half of which go to the United States. The principal articles of exports are sugar, tobacco, tropical fruits, rum, wax, and honey. It was formerly estimated that 90% of the sugar went to the United States but owing to the removal of a number of restrictions against Cuba by the "mother" country a greater portion goes to Spain, and our portion is now in the vicinity of 75 per cent.

In 1885 Cuba had 1150 miles of railways mostly centering in Havana from five different directions. Havana has communication by coasting steamers with all the principal ports of the island, and besides general telegraphic communication by the way of Key West with the United States and Europe, and by the cable line from the south of the island to Jamaica, the Isthmus of Panama, the rest of the West Indies and South America.

There are three steamer lines to New York, others to Key West, New Orleans, Baltimore, and Philadelphia in the United States, and Panama, Mexico, and other West Indian ports, and Europe.

The naval resources of the port consist of fair docking facilities afforded by an iron floating dock, with a capacity for vessels of 3000 tons owned by a private company, there are also three private marine railways, and a small government railway for gunboats at the Naval Arsenal. A large derrick

owned by the Government with a capacity for lifting 120 tons is placed along the city front half a mile from the arsenal. There are no private ship-building establishments and but limited facilities for repairs; but there exists ample coaling arrangements under private control.

The Naval Arsenal has machine and other shops/ foundries storehouses and a small marine railway, but no plant for docking or building iron or steel ships or heavy machinery. This establishment was officially declared closed on the 1st of January, 1885, from the inability of the island treasury to support it any longer. This fact is significant both of the waning power of Spain and of the impoverished condition of the Cuban Treasury.

At one time, from 1724 to 1796, the entire construction for the Spanish navy was here carried on and the island of Cuba supported the entire Spanish navy from tribute paid to Spain. In addition an extensive gun foundry was in active operation which cast the naval and other heavy ordnance then needed.

The position of Havana is shown to be so valuable a one for a naval port, that it is remarkable that its naval resources have been allowed to become unused and obsolete. Doubtless with the possibility of war they will be revived; but there are many things such as dry docks of large size, a metal working plant etc that cannot be provided in time, the awkwardness of this deficiency being evident when it is remembered that large Spanish ironclads had to be sent to American ports on the eve of complications with the United States. As far as the Gulf of Mexico is concerned it is only fair to say that the apathy of Spain and its paucity of naval re-

sources here are only equalled by the indifference and neglect of the United States upon the same matters.

The raw materials for naval construction and military purposes exist to a considerable extent in Cuba, timber abounds, nitre, copper and iron are found in quantities and coal has been recently discovered in the vicinity of Havana.

As for supplies in time of war, it would be impossible to create any stringency of supplies by a simple sea blockade of that port, the railroads centering in that city, and the 200 anchorages, landings and ports of the island with which Havana has direct or indirect communication would afford means for the constant supply of the city unless a land blockade was added or a complete sea blockade of the whole island was enforced. The number of landings, the dangerous reefs and unsurveyed coasts of part of the island would render the latter almost impracticable.

The topography of the country about and back of Havana is favorable for defense and the city and harbor are strongly fortified. There are places, however, in the vicinity of the entrance to the harbor which could be used for landing forces. Cojimar, three miles to the eastward, where one of the telegraphic cables land, and where the English landed at the time of their attack and capture of Havana, is still weakly defended. There is also a landing place on the beach near Marinas about six miles to the westward which is near the suburban railway to the city. This, by the last advices available, is also without sufficient defense. There are no harbors at these places affording protection.

By far the best harbor and landing place for a deliberate movement upon Havana would be the bay of Manel still further

Murid

to the westward of Havana, a place which will be referred to again. There is said to be within easy distance of Havana a regular force of from 18,000 to 20,000 men and within reasonable call also a force of "voluntarios", the turbulent National Guard of Cuba whose number is given as high as 80,000. These are composed mainly of "peninsulars" or native Spaniards, who are very loyal to Spain, inimical to Americans and not well disciplined.

There are five large forts about Havana, all strongly built and well placed but of ancient construction and with a great part of the ordnance obsolete. The ordnance is being gradually replaced by various guns of a more modern type.

A peculiarity in the nature of the land about Havana worth mentioning is the rocky and thin nature of the soil, affording little earth for the construction of the necessary siege works. If these were contemplated, the employment of material which would serve as a substitute for earth must be made and provided for. The country roads bearing inland about Havana are said to be very poor in the rainy season especially for wheeled vehicles.

It is stated as an opinion by military men, that if the naval and military forces holding Havana were in possession of information of a proposed attack in time, that the city could only be taken by a force of from 60,000 to 100,000 men, properly equipped and with a siege outfit. A naval force would probably be kept out of the harbor by torpedoes and heavy obstructions in the entrance in addition to the fire of the fortifications.

Coup de Main.

To the westward of Havana we find three harbors, not used as commercial ports, but places that would be useful singly.

or grouped together as a landing place and base of operations against Havana and Western Cuba. They are in order - ^uMariel, Cabanas, and Batia Honda.

The bay of Mariel is 22 miles to the westward of Havana and is a fine harbor, two miles deep and well sheltered. The entrance is narrow, but affords sufficient depth to cause the harbor to be considered a secure one for vessels drawing twenty-two feet and less. There is a small settlement here and sugar plantations near by which provide cattle to a moderate extent. Fresh water can be procured here and the place is considered generally healthy. A railroad runs from Havana, by a detour, to Guanajay, six miles distant from ^uMariel, to which a country road leads over a ridge of high land. The defenses consist of a small, but well placed and garrisoned fort of obsolete type and ordnance.

Cabanas, 12 miles west of Mariel and Batia Honda 12 miles west of Cabanas are harbored similar in nature and fortifications &c.

Cabanas is 12 miles to the west of Mariel. Twenty feet can easily be carried in here, 22 feet if the channel and landmarks are known. Ample room for anchorage will be found inside. Wood is abundant here but fresh water scarce. The back country is rich and fertile, with plantations where cattle and other supplies to a limited extent can be found. The defenses and capabilities for defense much the same as at Mariel.

Batia Honda is 12 miles west of Cabanas, 46 miles west of Havana. It was here the Virginius was surrendered to the United States. This bay has a very deep entrance and is well sheltered inside but affords extended anchorage only for vessels drawing 18 feet and less. This fact with the additional

one that the outer entrance is fringed with reefs makes this bay the least desirable of the three mentioned. There is no settlement on the bay but a town of 1000 inhabitants six miles back. There is a scarcity of good water here. The back country and the defenses are the same as at Cabanas. There is a coast road connecting these bays which leads to Havana and also other roads leading into the interior.

The coast from Batia Honda westward to Capr San Antonia is bordered by a succession of reefs and cays known as the Colorado reefs having passages and anchorages for vessels drawing up to 12 feet. This coast is dangerous and not well lighted or known.

There is a temporary anchorage that can be used near Cape San Antonio, the western extremity of the island of Cuba, just north of the Cape, with an opening leading to it between the cape and the other end of the Florida reefs, is Guadiana Bay which can take vessels of about 18 feet draught and where good water can be obtained. A river of the same name flows into the bay and by a narrow and crooked channel is navigable for boats drawing seven feet. A very rich country can be reached from this bay and river including the famous Vuelta Abajo region celebrated for its tobacco. By country roads the town of Guane and Pase Real reach this bay and export hides, wax, and tobacco. Both roads lead from these towns and Mantua North and South of the Cordilleras to Pinal del Rio, the present railway terminus of the railway system of the island.

The Island of Pines, off the southwest end of Cuba is heavily wooded but sparsely settled. There are some open anchorages but no secure harbors for large vessels. The principal settlement is in the north and is inaccessible for all but very small vessels. The timber of this island is valua-

ble and suitable for masts and spars. Cattle and good water can also be had.

The Yucatan channel, measured between the coast of Yucatan and Cape San Antonio, its narrowest part, is 103 miles wide. Through this channel the trade of the Mississippi and the southern ports of the United States would reach the entrance to the interoceanic canal. The anchorages afforded in the vicinity of this channel by the Cuban shore are of no importance. Havana is the nearest Cuban port and Cienfuegues on the south side the next port in the vicinity.

On the western side of the channel, off the coast of Yucatan and south of cape Catoche is [✓]Mugeres Harbor, a good anchorage inside of the island of the same name. Its geographical position makes it important as only tolerable harbor on either side of the Yucatan channel. It would be useful for that reason to the United States as a point for the defense of this outlet of the Gulf and for the protection of the trade going through it. A coaling station could be placed on Mugeres Island an unsettled island off the uninhabited portion of the main land. The harbor is 30 miles southwest of Cape Catoche and has ~~an~~ outer and an inner anchorage, the outer one an open roadstead with from 23 to 30 feet of water over a coral and sandy bottom and ample room with a depth of 4 1/2 fathoms.

The small inner harbor is fairly protected from the sea in all directions and can be entered by vessels drawing less than 20 feet - there being that depth of water close to the shore - Fair protection seems to be afforded from Northerns. The main land of this part of Yucatan is occupied by nomad tribes of Indians. The topography of the harbor shores and country about would make it difficult to defend, but works

could be erected to make the harbor untenable for an ordinary force of an enemy. Vessels using this harbor as one end of a line of patrol and Key West as the other could protect and guard both the outlets of the Gulf of Mexico going only over a distance of 300 miles.

Proceeding now to the southward along the coast of Yucatan and Central America, we come to the Cozumel Island whose only harbor consists of an exposed anchorage off the north end unsafe in Northerns but where supplies of cattle and poultry can be obtained from the settled Yucatan Indians on the island.

Along the coast we find both Ascension and Spiritu bays to be shoal with dangerous bars and small exposed anchorages outside. We next come to the coast and country of Belize, otherwise known as British Honduras. This is an English crown colony and now representative in its government. It has 160 miles of sea coast and is in area one third of the size of England and twice that of Jamaica. Near the coast the country is very low, in the interior it is diversified, being hilly and mountainous in the south, with an elevation in places of 4000 feet.

A recent expedition through the southern interior previously unexplored found a succession of valleys and hills from 1200 to 3000 feet above sea level, with mineral, agricultural and pastoral districts and a climate suitable for Europeans. The whole colony has a population of less than 30,000, of which numbers two per cent. only are whites.

(Chart of Belize.)

The port and town of Belize with a population of 6000. It is a distance of 300 miles from Kingston, Jamaica. English

cruisers patrolling between these two English ports, with supplies of coal and provisions at each, would seriously affect the trade coming out of and bound for the Yucatan channel. The harbor of Belize affords ample anchorage ground for vessels of all sizes, protected to seaward by a long line of reefs and cays, which extend along the entire coast of Belize. The harbor affords a depth of six and seven fathoms, with good holding ground, but the water shoals toward the town so gradually that large vessels cannot be nearer than two miles. The channel from the sea through the reefs, near the harbor is a narrow and tortuous and needs local knowledge or a pilot. Inside of the reefs and cays off the coast is a wide, deep channel leading up to the Gulf of Honduras, a distance of 90 miles to the harbor of Belize. This channel with five fathoms and upwards of water affords an easy access to Belize, and along the coast anchorages can be had at several places and also access to the sea for vessels drawing 20 feet and less and knowing the channels. It is said that Belize harbor is filling up gradually, various improvements are contemplated including a long pier and tramway.

The port of Belize is the only outlet of the back country especially that bordering on the Belize river at the mouth of which the town is placed. This river is very shoal but navigable for flat bottom boats a long distance. The ground along the town is low and swampy, the houses being raised about ten feet from the ground; it is claimed very confidently that the town is healthy or at least that its unhealthiness is very much exaggerated. The latter claim is the more probable one.

The principal exports are mahogany, dye and cabinet woods; the growth of sugar cane and the cultivation of the

banana and other tropical fruits added these to the exports. Manufactured articles, liquors and provisions of all kinds are the principal items of import. Belize is somewhat of a distributing port for Guatemala and the surrounding countries, it has now steamer lines to New Orleans and Europe.

The harbor can easily be defended, the garrison consists of a detachment of 250 men from one of the colored West Indies regiments which are to be removed.. It would make a good rendezvous for English vessels engaged in operations against the neighboring coasts of Central America or against the trade route from the Gulf of Mexico.

South of the colony of Belize, at the mouth of the Rio Dulce on the very limited coast line of Guatemala is Livingston, a free port of small size but some commercial importance and the outlet of the trade of the Gulf and river of Dulce and their tributaries. The trade is mainly in the hands of Americans, who control the light draught steamers plying on the lake and rivers. The Rio Dulce has but six feet of water at its entrance and thus effectually bars out the seagoing craft of the world from the magnificent sheets of water of which it is so poor an outlet.

There are safe anchorages to be found a short distance to the southward and eastward of Livingston at St. Thomas bight and Puerto Barrios both in Guatemala and deep enough for large craft. At the former place a Belgian colony was established some years since which resulted in a complete failure.

Reaching now the coast of the Republic of Honduras, the first place of importance is Port Cortez, also known as Puerto Caballos - this is a very good harbor, affording protection against northerers, though open to the westward. The shores are

bold, four fathoms being carried to within a short distance. This port was the terminus selected for the great Honduras Interoceanic Railway to the Gulf of Fouseca on the Pacific, which was a lamentable failure, the short stretch of railroad to San Pedro in bad condition representing all that is left of the scheme.

Off the coast of Honduras and belonging to its territorial jurisdiction, are situated the Bay islands. This group is at a distance varying from 20 to 30 miles, and composed of the islands of Utila, Bonacca, and Roatan. The first two are sparsely inhabited and of little consequence. Roatan Island, 28 miles from the mainland, the largest and most important, is 27 miles long and with an average width of 2 miles and population of 3500. It is the most important point, strategically speaking, in the Bay of Honduras, both in connection with that Bay and the countries of Belize and Northern Central America and the waters adjacent. It would be an excellent point to operate for the protection of our trade, menaced from Belize or Jamaica. Port Royal, on the southeast end of Roatan Island is the best harbor.

Roatan Island is well wooded and watered, tropical fruits and vegetables growing in quantities, there being considerable trade with the United States and this island by steamers and sailing vessels. The inhabitants are of a mixed race. The best harbor is Port Royal.

Coxen Hole and Road, is the seat of government, the road affords an anchorage protected to the northward but open to the southward for vessels of large draught. Coxen Hole is a small snug harbor for light draught vessels.

Port Royal - on the southeast end of Roatan Island - is a harbor of irregular shape one mile long, a width of half a

mile and depth of 5 fathoms. It is entered by two channels with 6 and 8 fathoms respectively, both crooked and narrow. The harbor is well protected and has bold shores alongside which vessels can lie. Wood and water abundant, but no settlement here. The harbor could be materially improved and entrance defended with great cost.

Truxillo on the mainland near by is of considerable commercial importance but an unsafe harbor in the time of northerns. Six fathoms can be found within a mile of the town. Exports are hides, mahogany, dye woods, sarsaparilla and cattle. Imports are principally dry goods and provisions. It is interesting to note here what a dependence Central American and West Indian ports have upon the outside world for such staple provisions, as flour, salted beef and other meats and fish and what are known as canned goods. Their needs are principally supplied from the United States, and should be exclusively so.

No other port or anchorage of consequence exists on the coast of Honduras and from Cape Gracias a Dios to the Mosquito Reservation there is also nothing worthy of note.

The Mosquito Reserve stretches along the coast of the Caribbean from 10° 30' N. to 13° N. latitude and for about 40 miles inland. This territory was semi-dependent and under the protection of Great Britain, so the English claim, from 1655 to 1850. By the terms of the Clayton-Bulwer treaty Great Britain resigned all claims to the Mosquito Coast, and in 1860 by the treaty of Nicarauga ceded the protectorate of Nicarauga. The reserve continues to be ruled by a Chief elected by the Mosquito Indians though the last one has not been recognized by the Government of Nicarauga.

Since the increase of prosperity due to the banana trade,

Nicarauga has taken steps to assume a close relationship with the Reservation.

There are no harbors upon this coast of any value. - Pearl Cay and Blewfileld lagoons - the most important being with shoal bars. There is considerable trade from these points, however, in fruits and Central American products carried by small American steamers to the United States. Blewfields Lagoon has from 8 to 10 feet upon its bar but beyond Blewfilelds up the river there is ample depth.

At Monkey Point on the southern part of this coast there is shelter offered especially against northerns and also a fair anchorage for vessels drawing 15 feet and less. This point about 50 miles north of Greytown has been spoken of as a possible position for a terminal harbor for a Nicarauga canal, and was the place proposed by Capt. Bedford Pim as the terminus of his interoceanic railway.

Off the Mosquito coast at a distance of 30 miles are two small islands known as Great and Little Corn Islands. These islands from their situation would become points of some importance in case of the opening of the Nicaraug canal, as a source of supplies. They are claimed by Colombia and have no good enclosed harbors but several fair anchorages. The inhabitants having a primitive form of government quite sufficient for their needs are composed of freed negroes of Jamaica origin and a few Mosquito indians. The population is about 500 and includes no whites. Earthquakes and hurricanes have visited the island.

Great Corn Island is about 2 1/2 miles long with land moderately high reaching an elevation of 370 feet. It has fair anchorages in the open bays of Southwest bay and Brig bay under the lee of the island, but there are no enclosed harbors on this or Little Corn Island.

Little Corn Island is 8 miles to the northward and eastward of Great Corn Island and is used principally for pasture. Tropical fruits, turtle shell and cattle are exported from these islands. Cattle and sugar cane can be raised here. American traders live here and deal with the inhabitants by barter. The islands are very healthy and forage and water are to be obtained. These islands are valuable only to us on account of their proximity to the canal.

Old Providence Island, off the Mosquito coast, belongs also to Colombia. This island is high of volcanic formation and remarkably healthy and fertile. It is well supplied with cattle and all tropical productions.

Catalina Harbor on this island is a large harbor for small vessels but with very restricted anchorage space for vessels drawing 18 feet and upwards. Coral banks are said to be growing up here.

St Andrew's Island. . somewhat larger than Old Providence Island is 150 miles from Greytown and due east of the Corn Islands also belongs to Colombia. It is both healthy and fertile, cattle and poultry are found, vegetables and fruits grow abundantly and good spring water is found. Its best harbor is known as St. Andrew's Harbor and presents a good anchorage for vessels drawing up to 19 feet. The entrance channel is intricate. This harbor is protected from the sea to the eastward but as this protection is afforded by coral reefs, there is but little protection afforded from the winds in that direction. There are six fathoms of water to be found in the harbor with 3 1/2 fathoms on the bar. The coral banks in and about the harbor are said to be growing up. The island is seven miles long - highest elevation 340 feet.

Returning to the mainland we find the only port of the Nicaragua Coast to be Greytown or San Juan del Norte, the proposed terminus of the Nicarauga interoceanic canal and situated at one of the mouths of the San Juan river. Population of the town about 2 000.

This harbor was last surveyed in 1884 under the auspices of the government of Nicarauga and from this survey we find that the harbor is nearly closed by a dry bar of shifting sand and where formerly the largest vessels used to lie there is but a depth of from 14 to 19 feet. An outside and rough anchorage is used about two miles from the town and as the monopoly of lighterage and unloading is in the hands of one person the expenses of this port are very great..

It is proposed when the construction of the canal is undertaken to run out a jetty and arrest the shifting sand and then dredge out the harbor so as to make a small terminal harbor or basin for this end of the canal. The estimate of the cost of this work is two millions of dollars. There is little prospect of anything existing here but a small artificial harbor sufficient for the purposes of accommodating a few vessels and protecting vessels entering into and departing from the canal. (The rise and fall being but 18 inches no tidal basin is required.)

The last surveys made over this route for a canal were made in 1885 and give a total length of the water route as 169.8 miles, with 7 locks, three on the Caribbean or Atlantic side, and four on the Pacific slope. One large dam and one side embankment are proposed. The free navigation (in Lake Nicarauga and the River San Juan) is to be 129.5 miles, the canal navigation 40.3 miles. The lock chambers are to be

650 feet long with a depth of water of from 28 to 30 feet.

Highest water level of Canal, 110 feet above the sea level.

Estimated time to pass through 30 hours. Cost with contingencies of 25%, \$64,043,697.

Chiriqui lagoon is the general name given to two large sheets of water separated in part by several islands, between which is a narrow, tortuous but deep passage. The larger of these bodies of water is known as Chiriqui lagoon while the smaller one to the northward is Almirante Bay.

Measuring from Boca del Toro, the principal settlement, we find this grand harbor to be about midway between Aspinwall and Greytown, 140 miler from the former, and 130 miles from the latter. It is about 600 miles southwest from Kingston, Jamaica, 760 miles from the Windward Passage, 840 miles from the Yucatan channel and about 1000 miles from Key West and Pensacola.

Its central position between the two routes for a canal, its magnificent harbors, its superior natural advantages for a naval station, the probability that the coal existing here will prove of value, and its fine topography for defensive purposes makes it eminently necessary and appropriate in the opinion of the lecturer that a position should be acquired here by the United States at the very first opportunity for a coaling and eventually a naval station.

If the Clayton-Bulwer treaty remains in force; the fact that this position is outside of the limit of the neutral territory, guaranteed by this treaty, makes it still more important. Its position for guarding the canal entrances and protecting the trade passing into and from it, is unsurpassed.

The waters were discovered by Columbus himself and the northern bay bears the name of the great Almirante, he having entered it in vain search for the "Secret of the Strait" and the way to the Indies. They were thoroughly surveyed by Capt. Barnett of the English Navy in 1839, and have frequently figured in the discussions of trans isthmian and interoceanic canals.

The general rule that the deepest harbors lie alongside the highest mountains has no exception here, and the highest of 6000 feet found in the most feasible pass, banish all ideas of canal and even railway.

The proximity of the Gulf of Dulee in the Pacific, and its fine harbor of Golfito has led to a grouping of these two places together and the acquisition of them both to the United States has been frequently urged. So valuable were these sites that speculators and others acquired a title more or less valid to great tracts of land about them, convinced by the great intrinsic value of these ports, that the United States sooner or later would be compelled to acquire them. These titles are believed to have become void on account of the non-fulfillment of the conditions required in the original concessions. The value to the United States to these harbors especially those of Almirante bay, have not diminished but has become greater as time has passed on and the construction of the ship canal become inevitable.

In 1860 these waters were examined by a Commission, appointed under the authority of Congress, to report upon the character of the harbors of the lagoon and Golfito, upon the quantity and quality of coal to be found there, upon the value of the lands of the Chiriqui Improvement Co., of the prac-

ticability of connecting the two harbors of Golfito and Chiriquí by railway, and finally upon the value of the privileges which had been made the subject of a confidential contract between the Navy Department and the Chiriquí Improvement Co.

The Commission consisted of Capt. F. Engle, U. S. N., Lieut. W. N. Jeffers, U. S. N., Lieut. Morton of the Topographical Engineers, and Dr. Jno. Evans, geologist. The time and means were not sufficient for the party to make a complete survey but enough was done to warrant Capt. Engle to conclude his report as follows: "that a practicable route for a line of railway had been found across the isthmus of Chiriquí, that it had been shown that the grand harbors at its termini afford every requisite for the protection for naval and commercial marine and for all practicable purposes to an unlimited extent, and that the geologist had also demonstrated that the best coal for steam navigation existed or near the Atlantic harbors of the Chiriquí lagoon". The civil war breaking out no further steps were taken to complete the contract referred to above; until the question of the deportation of the freed slaves came up in the early years of the war; preparations being then made to colonize them here under the contract spoken of above, to develope the country and the coal mines. These preparations were suspended it being deemed wiser to employ the freedmen on purposes connected with the war. Various other endeavors were made to establish coaling stations by the United States here. The last action taken being in 1881 when Congress in accordance with recommendation of the President appropriated a sum of money for establishing coaling stations on the isthmus; but of which after much discussion and long delay Secretary Hunt declined to

avail himself, on account of the doubtful legality of the title offered by the survivors of the Chiriqui co., the opposition of the Colombian Government and various other reasons. Since this time all official action on the part of the United States towards this purpose has ceased.

Chiriqui lagoon proper is 32 miles long and has a width varying from 5 to 12 miles. The entrance is over 3 miles wide with 10 fathoms of water which can be carried to all of the anchorages in this lagoon. The channel connecting it with Almirante bay has a least depth of 5 1/2 fathoms but is narrow and crooked.

Almirante Bay to which your attention will be principally called is about 13 miles in extent from East to West but with its interior so filled with small islands, that its shape and width is very irregular, the latter varying from 2 to 13 miles. In consequence of its formation the bay has truly and literally been said to possess harbors within harbors in which vessels of the largest class may enter without difficulty and in many places lie alongside the shores in security. This bay has two entrances direct from the sea, known as the Boca del Toro and the Boca del Drago, both available for large vessels. The Boca del Toro, the best and main entrance having a least width of 1/4 mile and least water of 5 fathoms, though 6 fathoms can be taken if the channel is buoyed. (R. & F. of tide 1 foot.) The principal settlement of these waters is at the main entrance of this channel and bears the same name. It is the seat of what little government exists, under the jurisdiction of Colombia. There are about 1000 inhabitants here, Indians, negroes and Spanish Americans who gather and export rubber, cocoanuts and sarsaparilla; the export trade being in the hands of Americans with a steamer route calling here in route to New Orleans.

Off the various bays and harbors in Almirante Bay, Shepherds Harbor is the best for a naval station. I shall only speak of that. It is 11 miles from the outer entrance to the bay, 4 miles long and about 1 mile wide. Oval in shape, it is formed by the main land on one side and Shepherd's Island on the other. It is entirely free from shoals, with a depth of 12 fathoms over mud, deep water close to shore and high land surrounding it, except at its two entrances at either end of Shepherd's Island. There is no settlement here and the only resources are the native ones of wood and water, good ship's timber and coal found in the vicinity.

The climate is healthy for a tropical one. Dr. Tyron of the Vandalia and Commander Picking of the Kearsarge both coinciding in this opinion, the latter after a stay of over three months.

The coal as quarried at present is from the surface and is reported to be lignite, and not available for sea going vessels; but would be useful for craft in the bay and for any establishments placed here. There is reasonable prospect of improvement in quality as the coal is mined at a greater depth. No road exists across the Chiriqui isthmus but one could easily be constructed when the settlement of the country or the interest around these waters would demand it.

Owing to recent legislation on the part of Colombia, alienation of territory is not now allowed, so a site here would have to be procured by lease or special treaty.

Of its advantages as a coaling station I will quote the following from living officers.

Admiral Ammen in a memorandum to the Secretary of the Navy states that Chiriqui is admirably situated for a coaling

station and easily defended against naval attack and it is conveniently situated for a naval force intending to control an isthmian canal by the way of Panama or Nicaragua. -- Captain Meade, who visited here in the Vandalia, reports to the Navy Department that as a harbor or rather as a multitude of harbors; the advantage of Chiriqui lagoon, including Almirante bay, have not been exaggerated. Its value to any power desirous of controlling the isthmus would be very great and undoubted.

Most of its anchorages could easily be prepared for defense in the event of war, by the ordinary resources of a frigates crew and with a few cannon behind redoubts; held against a fleet.

The objections generally urged against it are on account of its isolation from the world - not being situated advantageously upon any route, - the want of transisthmian as well as telegraphic and mail communication - the expense involved in an establishment here. There is no doubt that for an ordinary port of coal and refitting it now presents few or no advantages but as a strategic point, with the future possibilities and probabilities that we are gathering around us it has no equal on the coast line of the Caribbean or Central American portion of our Continent.

Copies for use & reference

Lecture No. 3.

of a course delivered at the Naval War College
in 1887 and 1888

by Col Swinton Dr. Comdt

Bray

A continuation of the examination of the Gulf of Mexico
West Indies and the Spanish Main.

Lecture No. 3.

A continuation of the examination of the Gulf of Mexico, West Indies and the Spanish Main.

Continuing along the coast of Columbia; we come to Aspinwall which is situated on what is known Naoy or Simon Bay, it is an exposed harbor especially during Northers - An artificial harbor or basin is being made for entrance into the canal. Aspinwall has been for some time a point on the trade route and transit established since the construction of the Panama Rail Road. Eleven steamer lines either touch or have their terminal point here and telegraphic connection exists by cable and land line with all parts of the world.

As the progress of construction of the Panama Canal is made the subject of report from time to time and of considerable unofficial Scrutiny by friendly and unfriendly eyes, it is not necessary to treat of its history and progress here.

The nature of the harbor of Aspinwall and of the resources of the isthmus will prevent it becoming much more than a terminal port, and no site for a naval station, even if other reasons allowed, could be properly selected here.

The resources of the isthmus of Panama are limited at present, almost all of the necessaries of life being imported and consequently a blockade of the isthmus from both sides would be felt most severely.

Porto Bello about 5 miles northeast of Aspinwall is one of the best harbors of Columbia and was of considerable importance in times past, it is however exceedingly unhealthy, there being dense swamps on the east side, and the port is of little commercial importance, the town being almost abandoned.

Cartagena is about 375 miles to the E. + N. of Aspinwall and within 100 miles of the direct track of vessels bound from the windward islands and Europe to Aspinwall. It is also within a comparatively short distance of the tracks of vessels bound to Aspinwall and Georgetown from the Mona and Windward passages. Hence it may be considered as holding an important flank position with respect to these great routes - more especially with those converging at Aspinwall. With the opening of the Panama Canal it will become one of the most important strategic points in its vicinity.

The population is 13000. The harbor is the best and most commodious one on the Spanish main, and one of the finest to be found in the Caribbean Sea. Large vessels can lie here in great security, and effect any ordinary repairs. Its length is eight miles and its entrance channel, though narrow and crooked has a least depth of six fathoms which depth can be carried the entire length of the harbor up to within three quarters of a mile from the city. - Rise and fall tide 1 ft.

The harbor of Cartagena is connected by means of a canal 8 feet deep - with the Magdalena river. Through this canal

8 to 10 light draught steamers ply to and from the Magdalena, securing for Cartagena a fair share of the great trade of that river and its tributaries, which extend to almost every part of the interior of Columbia, and furnish the readiest means of communication thereto.

The country back of Cartagena is fertile and capable of supporting a large population. Both provisions and laborers are sent from here to aid in the construction of the Panama Canal.

In 1886 the exports of this port amounted to over two millions of dollars, which went principally to the United States and Germany, and consisted mainly of cotton, cattle, coffee, tobacco, rubber and hides. (\$913,148. to the U.S. in 1887.)

Besides the trade from the Magdalena which furnishes Cartagena with the bulk of its exports, this port also commands the most of the trade of the Sinú and Atrato rivers, and is situated so as to become the leading port of Columbia and the Spanish main if the proper railroad and steamer facilities were afforded, accompanied by a settled country and increased enterprise. The imports amount to a little over \$1,500,000. Steamer lines touch here from West Indian ports, Alpinwall, New Orleans, New York and Europe. - Climate is fair but water scarce.

This port could be made a valuable Naval port, the only entrance could be easily defended, and there is ample space for anchorage inside, and places could be selected, masked by high land from an enemy's fire outside. The town however and the anchorages close by would be exposed to the fire of an enemy's fleet, against which the heavily built walls of the city afford but little protection.

The next point of importance is

Curacao, the most important of a group of three islands belonging to Holland & situated off the coast of Venezuela, which has one of the finest harbors in the West Indies.

The island itself is 30 miles long, high, and with a population of 25,000.

Santa Anna Harbor is on the South side; its entrance channel, is like a canal, narrow and straight, but deep enough for the largest class of vessels. From this channel the harbor opens as a magnificent basin, perfectly land locked, over 2 miles in length and with a depth varying from 4 to 10 fathoms. The entrance to the harbor has been recently improved. The harbor is secure, and the Island is said to be comparatively free from both hurricanes and yellow fever. The climate of the island is very dry affecting the products of the island, and

making water scarce and inferior in quality.

Here is the seat of government and the Military and Naval Station of the Dutch in the West Indies, there are no docking facilities, but vessels can be have down and refitted with stores, provisions & coal. The entrance is well defended by forts, and a chain is ready to be stretched across the entrance, which could also easily be closed by a system of obstructions. (A Garrison is kept here of 200 men). The value of the place as a Naval Station is lessened by the fact, that the harbor & town could be readily shelled by vessels carrying modern ordnance.

Suraco^a is now connected by cable with St. Domingo & Cuba.

Commercially Suraco^a is of importance as an entrepot for the Venezuelan and other ports of the adjacent mainland and for the neighboring islands.

When the opening of the isthmus canal takes place, Suraco^a is likely to grow very much in commercial importance, and from its position in the Caribbean, it may readily become as important as Malta is in a position somewhat similar in the

Mediterranean

If Germany should ever absorb Holland, Suracoa as a German colony would have direct bearings upon the canal routes through the Caribbean.

The connection of Venezuela and the islands of Tobago, Grenada and the Grenadines being so slight with the canal and the commercial value of the islands so insignificant a factor, thatomit their examination.

Barbados. An important British island is a little to the Eastward of the regular chain of Windward Islands, and opposite to ~~a~~ much used passage. ~~above referred to~~
It can be considered as upon one of the great tracks or routes of vessels bound to the Isthmus canal from Europe, as well as an the direct steamer route between Northern parts of America and Brazil.

There is little doubt but that this island would be an important point of call for many vessels en route to the Pacific by way of the canal, and hence have its commercial importance, already considerably, increased.

The upland roadstead which forms its principal & almost only port is of little naval value however.

It is a convenient point for the distribution and receipt of various staple articles, and

The Headquarters of the Royal ^{of Great} ~~West~~ India Company.

St. Lucia, now an English island was originally settled and held by the French, but became a permanent English possession in 1803. The French language is still spoken to a considerable extent on the island.

The island is about the same size as Barbados, but it is high and mountainous with a population of about 40,000, of which only 1,000 are white. This island has never been properly developed, there being a large amount of land ^{covered} yet untouched, with valuable building, dye & cabinet woods; there are also valuable deposits of Sulphur, which are unworked. A great deal of the land near the sea is said to be unhealthy on account of swamps and marshes. The growth of sugar cane is the principal occupation, the central factory or usine system, being in operation.

St. Lucia was selected as the English Naval Coaling station in the Windward islands and it is now to be fortified & garrisoned. Already it has become a favorite mercantile coaling station and will probably become the great coaling port for mercantile and naval vessels en route to the Isthmus and the interoceanic canal. The trade of the island is small, of which

The United States has one third, all of this trade goes through Port Fastrie, the capital and only port of entry. This town and harbor, the only one of consequence is on the Northwestern coast of the island, and is the harbor of the island used as a coaling station.

The harbor, though small, is an excellent one of about one mile in length & a width varying from 300 to 500 yards. 30 feet can be carried to a position directly off the town, and 22 feet can now be taken alongside the wharves at low water, the tide rising & falling 2 feet. The holding ground is good, the shore line being high, and the harbor open only to the N. W. (the N. E. trades prevailing in this region). There is a fine line of wharves built and building, enabling vessels to load and unload directly into and from ware-houses, and affording facilities for coaling. Improvements are now going on, or contemplated, which include the further deepening of the harbor, by removing some inner shoals and the building of a line of concrete wharves, alongside of which the largest steamers will be able to lie. The greatest objection to the harbor is its want of size. The telegraph cable lands here, and water and

and provisions can be obtained. Coal can be furnished to ships at the wharves at the rate of 60 tons an hour using Negraels.

{ Up to Feby 12, 1886 no work ^{was} done. Plans submitted for heavy forts in tiers on both points 18 ton guns. Main fort ^{to be} ^{the} site of Gov't house which is 437 feet high. Torpedo defences & submarine mines were contemplated Garrison proposed 1500.

{ A liberal sum of money has been recently granted by England for the fortification of this imperial coaling station and the provision of ordnance. But even with this it seems very probable ~~upon examination of the chart of the harbor, that armored vessels with modern ordnance, placed two or three miles off the entrance of the harbor or opposite some gaps on the mouth side could throw projectiles directly into the harbor, reaching the ship-ping and the town.~~ Landing places for an attacking force can be found to the Northward of the town, as well in a small harbor to the Southward.

Though very valuable both from its geographical position, the depth of water of its harbor and its facilities for a coaling station, St. Lucia does not furnish the necessary requirements in size or defensibility for a Naval Station.

Its position however is an important one. With deep channels to the Northward and to the Southward leading into the Caribbean, constantly in use, it is also directly south of the French island of Martinique with its valuable military and Naval Station. It has the important commercial and rich agricultural island of Barbados near by to the Eastward, and as St. Lucia possesses the best harbor the English have in the Windward islands, it is valuable as a strategical point, aside from its value as a coaling station.

Martinique, a French island and colony, the next to the Northward, is very important, containing as it does the Naval and coaling station of that nation in the West Indies, and in the Western Atlantic. It is a point on the best sailing route to Panama and its ports, with the harbor of Guadeloupe, would present the natural coaling stations and ports of call for the Naval and mercantile marine bound to and through the interoceanic canals. The Naval station at Martinique is a much more important point than Port Fauquier is or can be, as it affords facilities for repairs to machinery and vessels, and decking appliances, which do not exist at Port Fauquier, besides presenting a larger and more strongly defended

harbor of refuge and rendezvous for vessels. Roughly speaking, two thirds of the surface of Martinique is mountainous; its population numbers 170,000, of which 5000 only are whites, 20,000 Chinese East Indian or Negro Colies; and the rest free blacks or mulattoes.

The island is cultivated, sugar being the great product the central factory system for its manufacture being well developed. The other principal exports are cocoa & tropical woods.

The exports & imports amount in value to over £4,000,000. each. The imports of manufactured articles are mainly from France, of provisions, coal & lumber from the United States.

The "inspiration maritime" is established in Martinique. The garrison numbers about 700 men and includes, infantry, artillery and engineers. Martinique is the headquarters of the French North Atlantic Squadron, which is considered an essential part of the Maritime defences of this and the neighboring French islands. The military and Naval forces are supported by the Home Government, the colony rationing them while on the island.

Fort de France formerly known as Fort Royal Bay, is in the South West part of and is of ample ^{size}, and well sheltered in various places.

The entrance is very wide 3½ miles and 7 miles long, and the depth of water varying from 5 to 20 fathoms over good holding ground. The outer anchorage is not safe during the hurricane season.

The town of Fort de France is the capital as well as the military and naval station of the island. Population 14,000 - Good water supply by aqueduct, ~~2½ miles miles~~ ^{seventy six} wide between ~~Fort de France and Pointe à~~.

There is a stone dry dock here, built in 1868, costing over £1,000,000. and with a capacity for a vessel 360 feet long, 82 feet beam and 26 feet draught. This is the only graving or excavated dock in the West Indies or Gulf of Mexico, and the only one of any kind taking a vessel over 3,000 tons; it is intended to increase its capacity so as to take the largest vessel afloat.

There is close to this dock, the machine shops of the "Compagnie Générale Transatlantique"; all repairs not of a heavy nature can be done at these shops. Steamers of this company are to have armaments for war purposes, which are intended to be kept at Fort de France.

The Compagnie Générale Transatlantique is now required to keep a deposit of 20000 tons of coal here for naval purposes.

There is a Naval Station here, the French Men of-war availing themselves when necessary of the dry dock, which was built by the Colonial Government and of the surrounding facilities, in both of which the Home government has a certain interest from the aid extended by it. The telegraphic cable running through the West Indies lands here. The topography of the land about the bay is good for defence, though the town itself is too near the sea to avoid the effects of long range modern ordnance.

The fortifications are numerous, strongly situated, but until lately inefficiently armed. They were built in this century, and the ordnance is mainly of 6ⁱⁿ. M.L.R. and of 22 ton B.L. guns of modern construction, according to last reports there being 116 rifled guns mounted. 1500 men are needed to man the forts though the garrison would probably number 5000 men.

A blockade to be effective must include the whole island, and the country would afford few supplies for an enemy's force.

Landing can be and has been effected to the Northward of the bay. But very recently the

erection of new forts has been determined upon by the Home government to cover all approaches.

Fort de France is 1300 miles from Aspinwall - 1600 miles from Key West - 2200 miles from New Orleans - 1750 miles from Charlestown - 1800 miles from Norfolk - 2100 miles from New York - 3950 miles from Cherbourg and Toulon - 104 miles from Pointe-a-Pitre Guadeloupe

Guadeloupe the other French colony has a history somewhat similar to Martinique, being practically under the control of the English during most of the past wars, on account of their superiority upon the sea.

The cultivation of the sugar cane has monopolized the attention of the people of the island; tropical fruits and woods being the other principal products. The trade is larger than that of Martinique and similar in its nature.

Pointe-a-Pitre is the harbor of the Eastern part, and is the principal port of the island.

It is at the end of a bay and is well sheltered by islands, and considered safe in the hurricane season. From the security of the harbor it is likely that this will become the port of call enroute to the canal. The approaches can be well defended.

Les Saintes a small group of islands about six miles S.E. of Guadeloupe was once styled the Gibraltar of the Antilles, but it was captured by the English in 1809 without losing a man. The best harbor is Terre de Haut, formed by a grouping of some of the principal islets. It is small, being about $\frac{1}{2}$ mile in diameter, but deep and secure. The harbor and town are healthy and are defended by a strong work known as Fort Napoleon, and at present used as a military prison.

This place could be very strongly defended and is now often used by French men-of-war stationed in Guadeloupe during the bad season, as a secure harbor of refuge. The land being high around the harbor. Water is scarce, and the natural resources meagre.

With Martinique, Guadeloupe and Les Saintes, France has a strong position in the Windward Islands, and with a Naval force of sufficient strength and activity early on the seas, could as matters now stand, readily master all of the other Windward islands, as the defences existing of the other islands are antiquated in construction and ordnance and more or less in a state of decay. With the proposed defensive works and garrison at St. Lucia, this state of affairs will be

altered as to that place.

As to the United States, these colonies Fort de France, especially would serve as a base of operations against our trade to the Canal, and against our Southern ports. They would serve as a base of supplies and operations for the command of the ship canal, whether carried on afloat or ashore. Fort de France as a naval base is unequalled in equipments in the West Indies, Gulf or Mid-Atlantic.

Antigua is a small hilly island with an area about 100 square miles and with its coasts indented by creeks and bays, some of which form good harbors. It was for many years the principal Naval Station of the English in the West Indies, which was at

English Harbor on the South side, and is now only visited by Naval vessels. It is a small inlet perfectly sheltered from wind and sea. The channel and anchorage are very much restricted. There are 23 feet of water to be found in the mid channel. Vessels of 17 feet draught can moor off the northern wharf of the Dockyard and 22 feet can be found off the coal wharf. Rise and fall of tide - 3 feet. There are no stores here but coal and the dockyard is practically abandoned. The length & draught of modern vessels having rendered it of but

17.

little value, and no garrison being here. Of the Virgin Islands which belong to Denmark, St. Thomas is the most important in a commercial and naval sense. Its population is 14,000 and its geographical position and fine harbor have made it the principal port of call and coaling place in the West Indies for steamers coming from Europe bound to the various parts of the West Indies, Gulf of Mexico, Central America and the Caribbean Sea. In addition it is a natural port of call for steam vessels bound from the northern ports of America to the Spanish Main and South America. It has always been a great distributing point for adjacent islands.

The island is elevated and furnishes no supplies. The exports of the island consisting almost entirely of previously imported articles.

The imports are mainly coal, liquors, dry goods, oils and provisions. It is estimated that the total of exports and imports for one year amounts to £ 500,000.

The harbor of St. Thomas, upon which the town of Charlotte Amalia is situated, is small but excellent for vessels of heavy draught; it is easy of access and well protected from ordinary

wounds. 5½ fathoms of water is the depth of water into the harbor and 5 fathoms can be carried alongside the principal coal wharf. There is also good anchorage outside the harbor in East and West Negroe channels, to the North of and protected by Water island and connected by a boat channel with the harbor. The principal objections to the harbor is its want of size, and the fact that it is and has been subject to hurricanes and earthquakes. The iron floating dock here, can lift a vessel of 2,700 tons weight, 300 feet length of keel, 70 feet width, and 20 feet draught.

The climate is hot and the great facilities for communication bring the yellow fever and other malarial complaints, as well as diseases of an epidemic nature not particularly of tropical origin.

Notwithstanding these disadvantages, Saint Thomas is an important point in strategic sense. It is the key of the important Virgin and Negrao passages, and at the ^{apex of the} salient angle formed by the joining, as it were of the greater and lesser Antilles.

The defences of the port are weak and obsolete and it has a garrison of but 84 men. It is however capable of being thoroughly fortified, and though it will be open to an extent to

torpedo boat attack, still batteries with a powerful plunging fire can be placed at many points.

Porto Rico, has a population over 800,000, of which a little more than 50 per cent are white. St. John, the principal port or capital of the island is of value with respect to an inter-oceanic canal, principally on account of its proximity to the Mona passage and the large trade that will go through this passage to the canal. It is situated on the North side of the island with a population of over 25,000 and a fair harbor, the best on the island. The depth at entrance, is from 4½ to 5 fathoms.

The entrance is sometimes dangerous with a northerly wind. The inner harbor presents anchorage, which though restricted in space, is secure.

A large proportion of the trade of Porto Rico goes through this port, and with Railroad communications, which are promised, this is likely to increase materially. I look upon the Mona Passage, as one of the ~~most essential~~ ^{the great} and important passages by which the bulk of the trade of the United States will pass into the Caribbean sea and through this sea to the canal.

The passage is 65 miles wide and about 36 miles long, and free from hidden danger except in the vicinity of Saona island at the southeastern end of St. Domingo.

The three small islands in the passage, known as Mona, Monito and Deschelles are almost inaccessible, and of no value.

The island of Santo Domingo is 350 miles long, 150 miles in width, and with a mountainous range in the centre rising to an elevation of about 7500 feet.

The ~~commercial~~ ^{mineral} products alone embrace a range which includes ^{gold, silver,} iron, tin & rock salt. The resources of the soil include tropical fruits and vegetables, coffee, sugar, cotton indigo and tobacco, besides timber of all sorts.

Santo Domingo, with a population of 300,000 which is slowly increasing, occupies the eastern portion of the Island and is of Spanish origin. The trade of this Republic is not large, the exports & imports amounting to about \$2,500,000. each.

The country has developed somewhat of late years, but very slowly. Several railroads are proposed and one actually building from Samana Bay to Santiago.

The exports are mainly sugar, molasses, tobacco, honey, coffee, wal, tropical woods

including a fine grade of mahogany, and
hides. The imports are provisions of various
kinds, liquors, general merchandise, hard
ware, machinery &c. The trade is to a great
extent with the United States

It is stated that the Republic is capable of
easily supporting a population of ten
millions in almost luxury, which is not
far from the truth, providing a fair
amount of industry is contributed by
the inhabitants.

On the Northwestern end of St. Domingo and
on the Western side of the Mona Passage, is
the Gulf and Bay of Samana, very import-
ant in its geographical position, and in a
military and naval sense ✓

The Gulf is 30 miles long and with a varying
width of from 5 to 10 miles. The Southeastern
portion of the Gulf is full of shoals, which at
entrance extend nearly across the mouth of
the Gulf, leaving two deep channels, one
straight and sufficiently wide along the
Northern shore, the other narrow & tortuous,
and to the Southward named after and sur-
veyed by the U. S. S. Dispatch.

most of the shoals above referred to, the greater
part of this magnificent sheet of water is
available for the anchorage of the largest

vessels, ten fathoms can be carried to the head of the bay, ^{affording} practically unlimited anchorage space.

In the summer land and seabreezes prevail, and in the winter the N. E. trades; but the anchorages are safe in all kinds of weather, and when the wind is blowing, the climate is comparatively cool and healthy.

The anchorage most generally used in Samana Bay is in, and off the cove upon which the village of Sta. Barbara de Samana is placed, about 8 miles distant from the entrance to the Gulf. Here American & English Mail Steamers stop, and at one time visited a deposit of coal for the use of our vessels.

From Sta. Barbara westward for a distance of 15 miles, there are good anchorages along the North Shore, deep and well sheltered by the high land of the north side, which is bold and rises to an elevation of 1200 feet.

Hurricanes sometimes reach this bay.

On the southern shores, the best anchorage is that afforded by San Lorenzo Bay, it is well sheltered with a depth of from $\frac{1}{4}$ to 6 fathoms. It has been made lately a free port and will most likely become an important settlement, especially if, as proposed, it becomes the railway terminus in the bay.

Besides the importance which Samana Bay might easily acquire as an entrepot for this part of the West Indies, it is the natural outlet of an extremely rich plain known as La Vega Real, watered by the Yuna and Jagüi rivers, and extending from near Manzanillo Bay in the West to Samana Bay in the East. This rich plain is at present but slightly cultivated, but when the Railroad now in process of construction through the eastern part of it is finished, the development of this plain will doubtless follow.

This Railroad is being built by English Capitalists and when in running order will increase very materially the trade of Samana Bay, now quite small.

The Naval value of Samana Bay has been frequently recognized in the past and cannot be overestimated, since its importance will increase with the opening of the canal and with the consequent increase in importance of the Mona Passage, which it commands.

The establishment by the United States of a Naval and coaling station here, with competent defences would place us in a proper position with respect to the Mona Passage so important to us and with respect also to our interests and trade in the eastern part

of the Greater Antilles, the Windward Islands and the Eastern Caribbean generally.

The value of Samana is expressed by a French writer (St. Remy), as follows "Samana Bay, he says, is one of those maritime positions that ~~are~~ encountered, but in two or three places in the world. It is not only the military key, but the commercial key of this part of the world."

The bay is capable of strong defence, but this would require absolute control of the Levantadas Keys and the South shores of the bay near the entrance.

Of the ports of Hayti the only one having a Naval value from its geographical position and harbor is St. Nicolas Mole in the N.W.ⁿ part of Hayti. Its position with respect to the Windward passage at its N.E.ⁿ extremity and its proximity to Cape Mayassi and the Island of Cuba, makes it of value with respect to the direct and usual steamer route for the Northern ports of the United States and the Isthmus of Panama.

The settlement here is small.

The port and its approaches may be described in general terms as consisting of a deep outer bay too deep for ordinary anchoring, and the inner and outer basin, connected thereto.

The outer basin, or the middle of the three bodies of water, is about one mile long and with an entrance of nearly one mile in width, affords sufficient anchorage space for large vessels in 7 to 10 fathoms.

The channel connecting this with the innermost basin, is about 300 yards wide, with 19 fathoms of water. This basin is $\frac{3}{4}$ mile long and $\frac{1}{4}$ mile wide, thoroughly well protected and with from 6 to 16 fathoms depth of water. It is close and confined and difficult for sailing vessels to enter, but it is asserted that the whole port is an extremely healthy one. The soil about is poor.^{dry} This place is capable of being very strongly defended.

Tortuga Island off the coast of Hayti is of no naval value, its only harbor being small, partly surrounded and sheltered by reefs and only fit for vessels drawing 16 feet and less of water. Jamaica is the largest of the English West India islands and holds a geographical position so important in a strategic sense that it has naturally led to the establishment here of the principal English Naval Station in the West Indies in the fine harbor of Port Royal, near Kingston. The position of the harbor & island virtually commands the Windward Passage and its trade.

it is on the flank of the trade route from the Mississippi and the Gulf to the Canal, and makes a most favorable Military and Naval base for operations against Central America, the Isthmus and the Caribbean coast in general. Furthermore it would be the most favorable situation for the Naval base for operations by the English against the Gulf coast of the United States and the Mississippi.

Out of a population of nearly 600,000, however 15,000 or less than three per cent are whites.

The island is well watered, and ores of iron, copper, lead, zinc, cobalt and manganese are found with limestone, marble and gypsum.

Kingston is the capital and chief town with a population of 40,000. It is at a distance of 600 miles from Greystown and Aspinwall. There are two harbors at Kingston, the outer one known as Port Royal, the inner one as Kingston Harbor. Seven fathoms can be carried in to Port Royal, and ample anchorage for vessels drawing 30 feet, off the town and dockyard.

Kingston Harbor is approached through a narrow channel from Port Royal with a depth of 27 feet, beyond this is a magnificent harbor 5 miles long, with wharves alongside which the largest vessels can lie.

Both harbors are well sheltered.

Kingston has an ample supply of stores, coal, fresh provisions and good water, and is the principal outlet for a rich country.

A railroad from here leads to Spanish Town, the old capital, with extensions to the Northward and to the Westward. One American, one French, one Spanish and seven English lines call here. The telegraph cable lands here and there are some limited repairing facilities for machinery.

The dockyard, 4 miles from Kingston, though without docking facilities, or large hoisting apparatus, still has facilities for furnishing stones, coal and provisions and with a machine shop for repairs to engines and a plant for shaping and working iron & steel so as to completely repair vessels above the waterline.

There is a torpedo depot now here and the fortifications which until late were weak and obsolete have been very materially strengthened, extended and armed with modern ordnance.

There is a garrison of about 1000 men in
and about Kingston.

The railroad can be cut or reached by a
Spanish train from Old Harbor & Portland right.
The shipping that passes through the Windward
Passage en route to the Isthmus of Panama,
keeps as a rule on the western side of the
channel close to Cape Maysi and not very
far from the eastern end of Jamaica.
The readiness by which the trade through
here can be intercepted was shown during
our late civil war, when the Pacific Mail
steamer Ariel was captured and ran-
somed off Cape Maysi by a steamer
lying in wait.

Cuba is as large as England proper without
Wales, and is 800 miles long with 2000
miles of sea coast. In the importance
of geographical and strategic positions
with view to the canal and the routes there-
to from the United States, it appears to the
lecturer, that among the islands and coun-
tries of the West Indies, Cuba comes
first. Its commanding position with
respect to the Florida Straits and Yucatan
channel, is supplemented by its position
towards the Windward Passage and the
channels north of Jamaica.

These channels afford the ordinary and most direct routes to the Isthmus from the Atlantic and Gulf ports of the United States and they are all bordered on one side by this Spanish territory and colony.

The nearest large port to the Florida Straits and the Yucatan channel is that of Havana, which has been already discussed.

On the South the nearest large fortified port to the Windward Passage is Santiago de Cuba, and to the Yucatan channel Cienfuegos. These three ports are recognized and treated as the three great Military and Naval ports of Cuba.

We will now examine the South coast of Cuba from East to West. At the south east end of Cuba is an open anchorage off Caleta Point in 10 fathoms water at a distance of 13 miles from Cape Maisi and is known as Caleta anchorage. It is the only one in the vicinity and would be a useful one for vessels lying in wait to intercept an enemy or his merchantmen passing through the Windward Passage. Water and wood can be obtained on shore.

Santiago de Cuba, 107 miles west of Maisi has a fine well sheltered harbor, and a population amounting to 50000. It would be the port from

which all Naval and Military operations in South America would naturally proceed and is spoken of as a possible free port when the Canal is finished.

The entrance is narrow, at times diminishing to one cable's width, but with 5 to 11 fathoms and ample depth of water inside. Santiago is an outlet for a rich mineral and agricultural country, but the supply of fresh provisions is nevertheless limited.

The City itself is four miles from the sea and the trade is large; the exports alone to the United States in one year amounting in value to over \$1,000,000. consisting of coffee, iron ore, honey, tobacco, copper, guano, tropical fruits & 300,000 tons of iron ore were sent from here to the United States during the last three years.

This comes from the Jureque mines by a short railway and shipped by means of a long iron pier.

These mines, railroad and pier are owned and operated by a company consisting of the Bethlehem Iron Works and the Penna Steel Company of Harrisburg. \$1,500,000. were expended here before a ton of ore was shipped. The ores are rich (65 ct. metallic iron) and will be extensively used in the manufacture of steel.

for Naval purposes. There is another short railroad running into the interior, all other communication being by steamers or country roads. The telegraphed cable from Jamaica lands here and connects with the land system.

Valuable copper mines exist in the vicinity worked by an English company. The town is unhealthy with frequent visitations of yellow fever and other contagious diseases. Coal used in and about Santiago, is brought from the United States. The defences, originally strong, are now in a weak state and there is nothing of consequence defensive inland. Landing can be effected at Atares Bay, 12 miles to the Eastward of Santiago. The back country is mountainous, and about here the late insurrection flourished. Santiago is capable of a strong defence, the entrance can be made impregnable by torpedoes, obstructions and land defences, even chains have been used to stretch across the channel. The Garrison in and about the city numbers 2,500 men. The Naval resources existing here are scanty.

Puerto, is about 200 miles by a navigable route from Cape San Antonio and about 200 miles from the ~~usual~~ trade route to Aspinwall from the Yucatan channel. It has a population of 25,000, and is ~~one~~ of the most important ports

upon the island. The entrance to the harbor is 2 miles long, crooked and very narrow in places. Least water $4\frac{1}{4}$ fathoms. Range of tide 2 feet. The harbor inside is large and deep with good holding ground. Large vessels anchor a half mile from the wharves of the town.

Sanfuegues is the outlet of a rich sugar country and is connected both with Havana and Matanzas by rail. It has a large trade about three-fourths of the cargo being with the United States. The principal exports are Sugar, Rum, Tobacco &c. The imports being provisions, coal and Machinery.

Lines of steamers run to New York, Boston and New Orleans, besides coasting and other lines. The West India cable lands here from Santiago. There are two small marine railways and some few other facilities for repairs.

There is some little internal water communication here, by means of small rivers, which empty into the bay, in this way reaching various sugar estates by light draught steamers & launches. The climate is fairly healthy. The town is 6 miles from the sea, and the crooked, narrow entrance of the harbor rendering it easy of defence.

The defences existing, once strong, are now obsolete. The garrison numbers 1200 men. There are available places for landing men to the eastward of the

entrance

Returning to the North coast, we find at its eastern part, various bodies of water of sufficient size and depth to receive vessels of large size, although they are not of commercial importance. The best is the Bay of Nipe, which is directly to the southward of Santiago, the distance overland being 45 miles. It would make a fine rendezvous and point of supplies for vessels intending to operate against Eastern Cuba or the Windward Passage.

We have now finished our examination of the coast and ports of Cuba, the last country to be discussed in this lecture, but the first of all of those islands and colonies to us, in greatness of trade, intrinsic value and strategical importance.

Recapitulation ✓

In reviewing the examination of the Gulf of Mexico and the Caribbean Sea with respect to its commercial and naval bearings to the Trans-istrian Canal, we find that the portion of this water area which concerns the United States and its trade to and from the canal will be that lying west of a line drawn from the southwest end of Puerto Rico to the point of Santagana in Colombia.

Channels or Passage

This area includes the three valuable passages through the West Indian chain of Islands, known as the Yucatan Channel, the Windward Passage, and the Mana Passage.

Commercially and in times of peace, the Windward passage is probably the most important, as it is part of the direct route to the Isthmus from the great commercial ports of the North Atlantic coast of the United States.

The Yucatan channel would come then in second order, being the channel of the trade of less magnitude coming from the Gulf and Mississippi River bound to and from the Isthmus as well as part of the homeward bound trade to the North Atlantic. In connection with the Florida Straits it could be used for ~~the~~^{no gun ships} ~~war~~^{and} ~~commerce~~^{trade} & The Mana Passage, a favorite one for the sailing trade to the Isthmus would then be third in importance.

In time of war however the Yucatan channel would be the first in importance and most useful to the United States, and the one most within her control.

War with any country would find our trade and shipping badly placed in using the Windward Passage.

Especially would this be the case if the war were with Great Britain or Spain. ~~not only~~ On account of the close proximity and commanding position of Cuba and Jamaica ^{but also for} ~~and~~ the facilities afforded by the Bahamas and the anchorages of Cuba and Hayti, for vessels and squadrons lying in wait.

All other European countries possessing or likely to possess colonies or ports in the West Indies would be placed at better advantage and more within reach of the American trade passing through here, than that passing through the Yucatan channel.

For the same reasons the passage through the Maria channel would be inferior to that of the Yucatan channel, besides the time lost in the detour necessary.

The Yucatan channel, ^{and the Florida Straits}, would be under the protection of the Naval forces emanating from Key West, Pensacola or the Mississippi, who would consequently be readily within reach of their base of supplies and coal. The concentration of both our Gulf and Atlantic trade in this area would allow of a most convenient concentration of naval forces and operations. The most important ^{ports} and waters in a strategical sense to us and our trade to the same would be in order named as follows:-

Pensacola (or whatever place becomes our great Naval port in the Gulf), Havana, Key West, Chiriqui Lagoon, Kingston, Jamaica, Santiago de Cuba, Samana and Fort de France in Martinique. The latter place is included in the above enumeration less for its geographical position than for the abundance of its Naval resources, and the fact, that it is the great Naval port of France in this part of the world.

Of the ports of secondary importance in a Naval and strategical sense, Cartagena in Colombia, Cienfuegos, St. Lucia, Suracoa and St. Thomas are of value in ^{the} order named, and for the reasons given in preceding pages. They are however mostly out of the area of greatest importance to us. Suracoa would of value and importance in case, as is possible, it becomes a German colony.

The ports that would be primarily, in these waters, bases for Naval operations, would be Pensacola, Havana, Kingston and Fort de France.

Lect. No. 7.

A strategic study of the Pacific coast from the Gulf of Panama to British Columbia with special reference to the interests and military policy of the United States.

The great Masters in the art of war have announced as an axiom, that of all things which contribute most directly and effectually to the success of a Military undertaking, Preparation holds the first place.

This axiomatic concert, and rule, made for the first time many centuries ago, and repeated often since was never truer or more pertinent than at the present day.

Wars are shorter, warlike appliances more effective and complicated and military movements more rapid; while the masses of men and materiel to be manipulated are greater now than ever before in the history of the world. Hence the time of preparation is necessarily longer and more absorbing. The actual war time being shorter, more concentrated and moreover overwhelming.

A celebrated English military writer in discussing the present military situation in Europe puts the phases of modern war in a most effective way before us when he says - "It may well give us pause to speculate upon what may

to happen at no very distant future: - the victor in the coming strife, for come it must, may stand the possessor of unlimited resources, resources which Napoleon never imagined in his wildest dreams: - trained men outnumbering his in the proportion of at least five to one. means of transport by sea and land immeasurably greater, independent of weather and at least five times as swift; - means of communication so incalculably rapid as to be practically instantaneous: - better food in far smaller compass: - death dealing weapons lighter and more mobile, delivering with unerring certainty their blows from tenfold distances with twenty fold rapidity.

If Preparation is the first thing necessary to success in War, to no country is preparation more essential than to ours, whose experience in actual war has been meagre, whose population and pursuits are normally so peaceful and whose situation and isolation heretofore has allowed a growth so rapid and great that we have attained rank as one of the few great powers in the world without having been obliged to establish our position by the test of an extensive or great foreign war.

It has been said that great states which have risen out of chaos require time to consolidate and organize themselves; their whole power and energy

being chiefly directed toward that point.

During this period of consolidation and organization their foreign wars are few, and the wars that do take place bear the stamp of a State ~~unity~~ⁱⁿ not well cemented.

In repeating the statement thus made, we are ^{not} only repeating a general truth but we are also summarizing to a great extent the military experience of our own country.

The Revolutionary war with an existing Tory element, the war of 1812 with New England reluctant and protesting; the Mexican war with a Northern lack of sympathy for the ultimate objects of the conflict; and finally the great civil war, all emphasize the condition of a Nation not well cemented in unity nor fully consolidated in strength.

With the close of the civil war, and the definite establishment of the Union and the Nation, and a consequent increased homogeneity of the country North and South should end the period of internal consolidation and begin the development of external strength.

With the new period about beginning will come a conflict of interests - first with other powers in respect to their interests upon the American continent, and secondly with other great powers in regard to our growing and antagonistic

interests in the great field of the world.
Out of this great clashing of interests must arise occasionally a period of War - at rare intervals as we all hope but none the less inevitable.

For these occasions of war, the work of preparation should now go on. The duty of performing this work, which includes a knowledge of the art and practice of War, especially Naval War, for which this College was instituted, belongs to us.

Admiral Fremantle of the English Navy, in speaking upon this subject, refers to the preparation of War, by saying that "Naval Campaigns and naval operations must be thought out before hand and carried out with a quickness and vigour which the more leisurely operations of former days did not demand." This is what directly results from the power of speed, now at our command.

As a part of the work of preparation the naval study of our own and foreign waters; of our own and adjacent coasts, is not of the least importance. These sea areas will be the battle grounds for our Naval defence or offence, the theatres of war; while the naval arsenals and dockyards will represent the entrenched camps and the bases of operations. - the coaling stations being the outposts in these areas of future campaigns and fields of coming strategy.

As a sub-division of the work just referred to, this and the following lecture will be devoted to an examination and study of the strategic features of the Pacific coast of North America and in a more general way to an examination of the whole of the Pacific Ocean.

It is not considered that this subject is treated here in more than a tentative manner; a study of the elements and simpler combinations only is made, but it is hoped that by calling attention to the prominent features of this most important field, that more exhaustive work may result in future. Report to be ~~for~~

As every war should have a definite object, so should every campaign have its objective point and though the object of the war and the objective point of the campaign can best be obtained by the destruction of the enemy's force, still there are some points whose strategic and general value are so great that their possession is at once sought for. Among these points upon the world's surface, the Isthmus and Gulf of Panama may be classed as among the very first in importance.

The value of the Isthmus will be great without a canal, greater if one of the two American ship canals should be opened here, but of course of the very greatest, if the only canal between the two oceans pierces the continental Isthmus at

this point. Even with the canal at Nicaragua, and putting aside all commercial questions, the Panama canal would still from its short length, central position, and the convenient islands and bays upon the Pacific, be of the most value for rapid communication and for military and naval operations.

It would have the advantage over the Nicaragua canal as a primary base for operations against the South American Coasts and for attacks upon the South American and Australian trade proceeding from the North Pacific or from the Nicaragua canal itself. For these operations secondary bases present themselves in the Galapagos group of islands or the port of Payta in Northern Peru.

The Isthmus and Canal of Panama once secured, must be held after capture principally by a naval force. With access to Aspinwall denied to a hostile force in the Caribbean by the proper military works, the greater part of the Naval force guarding the Isthmus, would best be placed on the Pacific side, ready to pass through the Canal to the Caribbean when required. The best and largest anchorages, most favorable weather and climate, as well as the most available sites for depots and Naval stations being in the Gulf and Bay of Panama.

From the features of this bay and gulf as described in a previous lecture, it can be seen that the only

attack and defence practicable here is a naval one and the Nation having the most powerful fleet can easily seize and hold it, commanding all its many islands and anchorages. A force occupying the line of the railroad could command the land transit and the canal, but the water access cut off this command would have little value and short duration.

In addition to this the resources of the Isthmus are very limited and a sea blockade would prove most exhausting to the forces ^{and} inhabitants of this place, which depends so much on the outside world for necessary supplies of all kinds.

The canal once in possession of the Naval forces should be held by both a force afloat and ashore and all exposed points, locks &c securely watched.

The Canal could then if necessary be used as a base of operations against any hostile forces on the Isthmus on either side of the canal.

Either Payta in Peru or the Galapagos Islands in the South Pacific, distant about 900 miles, would serve as bases for hostile operations against the Gulf and Bay of Panama, if Panama with the Central American coast were in possession of the United States. These positions to southward are ones likely to be used by England, France or Germany. A Naval sentiment already exists in England favoring the acquisition of the Galapagos

group by that country. With the possibility of the construction of the Panama Canal or even without this possibility, our country should never consent to the acquisition of these islands by any European power. As a rendezvous in time of war the advantages of this position for offensive operations would be much lessened if no previous possession and development were allowed, as the native resources are comparatively meagre and the distances from Australasia or the Home Countries, which could serve as the source of supplies would be very great.

If the Nicaragua Canal should be built and in the possession of the United States, the operations of an enemy's fleet in the Pacific against that canal and its adjacent positions would most probably be from Panama as a base.

The necessary supplies could be furnished by rail or canal to an English fleet, from Jamaica, St. Lucia and Barbadoes; to a French fleet, from Martinique and Guadeloupe, and to a Spanish force from Havana and Cuba. A German fleet would probably establish a base also in the West Indies. This readiness of supply from the West Indies and the Caribbean emphasizes the urgent necessity for its control by our naval forces in case of war. If this control should be wanting to us however we would fare better in the Pacific than any European nation would

under similar circumstances, as we alone possess an entirely satisfactory base in San Francisco, which though distant would be the nearest at hand, and the route to and from, which would not be flanked by any strong maritime country.

In case of war with Great Britain, Esquimalt in British Columbia should be too fully occupied with its own safety to be able to supply anything by water to Panama, without considering the danger incurred in a line of communication passing along 1200 miles of an enemy's coast line.

North of Panama, the most strategie point that presents itself is Golfito in the Gulf of Dulce. This harbor would be of great value in case of operations in and about Central America; if the Veraguas lagoon on the Caribbean was occupied and fortified as a Naval Station of importance.

Aside from the native resources of coal and provisions that can and should be made available hereabouts, good means of communication should be established between the two places and a considerable depot of supplies formed. Golfito being between the proposed terminus of the Nicaragua Canal and the Gulf of Panama could watch both places and protect or menace the trade to and from either.

It would also be the nearest point from which operations could be maintained by us against Panama and the South American coast. Only by the occupation of such a place, and its development as a station, could we successfully guard, blockade or menace the Pacific entrance to a ship canal. The choice of Golfito would however depend upon a like choice of the Chiriqui lagoon, as Golfito has serious climatic disadvantages of heat and moisture.

If the Nicaragua canal should be constructed the facilities that could be afforded by the two small terminal harbors, Greytown upon the Caribbean and Brito upon the Pacific, would be so limited as to forbid the establishment of Naval Stations at either of these places. This has led to the suggestion that such a station should be established upon one of the islands of the inland Lake of Nicaragua. Commander H. L. Taylor of the Navy in a paper read before the American Geographical Society in discussing the construction of this canal as a government measure by the United States, advocated in that connection the establishment of such a station upon the Lake as a Naval base and strategic point in time of war for operations upon the Gulf of Mexico, the Caribbean Sea, and the Atlantic and Pacific Oceans.

From this point he proposed that a fleet, held there in reserve, should sally forth on either side, in unison with the respective squadrons of the North Atlantic or Pacific to dominate and control either or both coasts thus

— appearing as directed by telegraph, on either coast, at any point, without warning and in overwhelming force. The idea proposed of sowing in this way and over these large areas, a Naval punishment of such weight and strength, is a very fine one, and if practicable and duly carried out, would make the United States the mistress of the neighboring seas and coast. But is it within the realms of probability that if the United States were at war with any Naval power, that this would be allowed.

Having of the fleet and station in the Lake, the first duty of an enemy would be to close the canal and securely bottle up the fleet and render useless the Lake Naval stations. This could be done by a blockade of either or both ends of the canal, or much simpler by the application of gun cotton or dynamite to locks; by placing heavy obstructions in the canal, by the cutting of the dam or side embankment that is proposed or by the permanent possession in any way of a portion of this long river and canal route. By any of these methods the Lake fleet could be

confined to the simple duty of protecting the inland waters of our Central American allies. The protection of the Canal can be best done in my opinion from the Exterior and the strategical movements from the Pacific, as well as in the Atlantic, should emanate from points situated upon the shores of the Oceans. Carinto is the principal commercial port of Nicaragua upon the Pacific, and will most probably bear ^{the} same relation to the Nicaragua Canal that Alexandria does towards the Suez Canal. It would not make an available place for a Naval Station, but would be of importance in any land operations that would concern the Canal or Lake of Nicaragua or Nicaragua itself. A railroad, the only one in the country now connects this port with both Lakes Nicaragua and Nicaragua and this railway lines in connection with the lakes and the San Juan river already form an interoceanic transit route available for the greater part of the year.

The next place of importance upon this coast is the Gulf of Fonseca with us its most available point for Naval purposes. Tigre island, now belonging to the Republic of Honduras. If the Chiriqui lagoons and Golfito are not made naval and military ports, Tigre island is the point of the most strategical value in my

opinion, for the purposes of a base of operations on the Central American coast.

The Gulf of Fonseca bordering upon three Central American States has of itself considerable strategical value, and as the most available body of waters, with probable rail-road communication to the high lands of the interior and to the Atlantic side, it would have features of more value than Golfito considered alone. Its position nearly four hundred miles nearer San Francisco would still keep it within 900 miles of Panama.

La Union's Coast of Panama. The distance from San Francisco would be 2,300 miles, which would be easily possible to modern vessels steaming economically without immediate fear of an enemy. With a midway point of call and coaling the approach to this station would be made with ample reserve of fuel. Acapulco is the best harbor for the midway point between Central America and San Francisco which necessarily must be in Mexican territory - a passage could of course be made at a flavor rate of speed from San Francisco, with a vessel having a large coal endurance, or rather from San Diego, but even then the Central American station would be approached ^{with} but little fuel and the ship or squadron would be in poor

condition for engaging a hostile vessel or squadron, that might be met off or near this station. Coaling at Acapulco would only be denied to an American vessel in case of war with Mexico, in which case Acapulco should be captured at the earliest stage of the war.

The hospitality of a neutral port like Acapulco should give our vessels sufficient coals and to enable them to make a passage to a home port to the northward or to the Tigre Island, for instance, Golfito or Panama. 1200 miles distant.

If the United States should ever become involved in a war with Mexico, the two most important points in a strategical sense would be Acapulco and Guaymas in the Gulf of California.

Mazatlan from its size, wealth and trade would be of intrinsic but not of naval value and it would be easy of capture.

The value of Acapulco has been spoken of and results from its fine harbor and central geographical position. From this port the naval control of the coast of Mexico south of Cape San Lucas could be assured. The topography of the ^{back} country renders it inadvisable to penetrate into the interior, and its possession is not necessary for holding the town. The French, during their invasion of Mexico held and used the port, without attempting to control the high

mountainous country inland.

Guaymas besides having an excellent harbor is the Mexican terminus of the American railway system in the Gulf of California. Its possession would give control of this Gulf and it would make a good base of operations against Lower California, as well as a fine station for supplies, being almost equidistant between the Gulf of Mexico and California coast and connected with both by the Southern Pacific Railway systems.

Besides the local supplies that could be obtained from the rich State of Sonora, military and other supplies could be obtained from Los Angeles on one side and San Antonio on the other.

The western coast of Lower California can readily be reached and controlled from San Diego. In case of any conflict with Mexico this peninsula could be at once absorbed by the United States without trouble aided most probably to a great extent by the inhabitants especially those living near the American boundary line.

Upon the Pacific coast of the United States San Diego (with which I include the islands of the Santa Barbara group near by), San Francisco and its bays and the waters of Puget Sound

are the three places that are of the first rank in strategical importance.

San Diego has a good harbor, good railroad connections with the North and East reaching to Washington Territory, to the Mississippi and the Atlantic, an excellent climate and a rapidly developing back country. Its possession by an enemy would involve very serious loss to the United States causing an interference with the Southern trade from the Pacific coast both on land and sea. Its loss would also involve that of the Santa Barbara group in case this group had not already passed into the hands of an enemy. The holding of this Bay should be considered highly important, and as its defence involves provision for the security of the Santa Barbara Islands and the open bays and anchorages to the Northward, the active services of a Naval force are needed. San Diego harbor being easily shelled from the outside, and remote from the coal, iron and lumber districts of the coast, is not available as a Naval Station, but it is an excellent place for a rendezvous for the vessels needed in defending these waters and should be well fortified for that purpose and as a harbor of refuge for the mercantile marine. Some of the Santa Barbara islands would give

to the Naval force of an enemy good points upon which to base an attack upon San Diego or other Southern California ports and anchorages near by; and if this force should not be able to hold any of these points it never the less could cause much loss of property and suspension of commerce by occasional raids. The railways in this vicinity can be reached from the coast at various points, landings being practicable at points which could not be easily fortified.

The Santa Barbara group should in time of peace and at present, be prepared by us for an occupancy, which would be necessary for defence in war time and as the topography of those islands admit of easy defence, these islands and their anchorages could be denied to an enemy leaving our Naval forces free to look out after the main coast line and the trade routes running near by it and from the Illinois railways and the great ship canal that is to be.

Reference has been made in a preceding Lecture to the admirable suggestions made by Commander Taylor in regard to some of these islands, the simple preparations recommended by him should be at once made by the proper authorities.

The geographical, topographical and climatic characteristics of Southern California are so different from those of Northern and Central California, from which it is separated by a transverse range of mountains, whose lowest passes vary from 4000 to 5000 feet above sea level, that the subject of its military and naval defence should be considered apart from the question of the defence of the remaining portion of the California coast. If petroleum which seems to be the ~~invaluable~~^{probable} fuel of the future, should become a practical success in this respect in our day, Southern California would present in future greater naval advantages and independence of resources, than now, there being already pipelines to the seaboard existing for the purpose of carrying the oil, which apparently abounds in this section. This would compensate for the absence of coal.

San Francisco is, and bids fair to remain, the great port of the Pacific. Its fine harbor and interior bays, its rich and productive back country, great water and railways and magnificent resources make it the place for our great Naval Arsenal upon the Pacific.

Puget Sound will most probably be our great shipbuilding place, our Delaware and Clyde, but San Francisco with its wealth, geographical position, large internal water area and open

climate, will be our New York and Norfolk rolled into one, and presents advantages and resources for a Naval Arsenal and Dockyard unequalled upon either coast.

Aside from the dry dock at Esquimault, San Francisco has the only excavated dry docks upon the West Coast of North and South America as well as the mid Pacific; and France with her many colonial possessions in the Pacific had to send her larger vessels to be docked there or be compelled to seek the large docks in Australia or British Columbia.

So much is involved in this very question of docking, that I cannot resist calling attention for a moment to its connection with Naval strategical questions.

With periodical docking and the consequent retention of speed in vessels is involved one of the most prominent factors of naval warfare. The creation of speed for naval vessels is being recognized universally as a matter of the first importance, but the subject of retaining the speed thus provided has not engaged so much attention. And yet the unsheathed bottoms of our new vessels are particularly subject to fouling with resulting loss of speed, and increased consumption of fuel.

Recent experiences given by commanding

officers in the English service emphasize this matter. One Admiral found his flag ship lose two knots in six months; while Captain Kingscote very recently stated that his ship the "Surveor" dropped three knots of speed while under his command from a foul bottom and want of docking.

The loss of the "Huascar" and the consequent gain of the control of the west coast of South America by the Chilean Navy was as much due to the foul bottom of the Huascar and her loss of speed as any one thing. Coal endurance, speed and facility for maneuver all suffer by the foulness of ships bottoms, which suffers from a want of docking appliances upon a sea coast or a want of proper geographical distribution of these facilities.

Out of the three points named in this lecture as the most important ones upon our Pacific coast, San Francisco alone contains the proper docking facilities. These are required at San Diego and Puget Sound, and if they cannot be created by private capital alone, they could be furnished by a combination of private and government funds, and at least at Puget Sound by the government alone.

The area of the Pacific to be considered in connection with Naval operations against San

San Francisco can be included between two lines drawn from the Hawaiian group, one to the Northern and Eastern ending at Vancouver's Island in British Columbia, and the other to the S.^o of East ~~south~~ ending in Acapulco in Mexico. The first line is a little over 2,800 miles in length, the second line a little over 2,900 miles in length. The distance between San Francisco and Honolulu is less than 2,100 miles.

For the purpose of a Naval attack upon a coast, the immediate base of operations should be at a less distance than San Francisco is placed from the Hawaiian group. Taking as a ~~very good~~
~~average~~^{fair} ~~best estimate~~ for the full speed limit of a modern fleet, the distance of 2,400 miles, we could safely say that a squadron could not with a fair hope of success make even a hasty descent upon an enemy's coast at a greater distance from a coal depot than is represented by two thirds the average full speed limit, which would be a distance of 1,600 miles. This would make the Hawaiian group at too great a distance for the purpose of an immediate base against San Francisco, and would necessitate the choice of an intermediary base upon the coast for an enemy's force approaching from that direction. Furthermore as the only port in the Hawaiian group now open that furnishes facilities or

Smooth water for coaling is Honolulu, with a channel entrance allowing only 21 feet and less draught of water, it is not likely that this group will be used as a primary base by the Naval forces of a Nation not holding sovereignty over this group. The group would prove an important point of call for vessels or squadrons from the Australian and Pacific waters who could here unite and reach by economical steaming Esquimalt on Vancouver's Island especially if they did not fear an enemy of equal or nearly equal force when they approached that vicinity.

Some place on the Pacific coast would then be selected as the immediate base of operations against San Francisco. The English have far this Esquimalt, with native resources of coal and fresh provisions; fair docking facilities, and the military highway of the Canadian Pacific Railroad as a source for military supplies of all kinds.

If the United States had a suitable Naval force on the coast of California, a vessel or squadron coming from the southward could not effect much damage to trade, especially to steamers proceeding to or from San Francisco.

The attack proceeding from the southward must be watched for by the Naval force off the coast, a scout or rapid cruiser being stationed in

the vicinity of Cape San Lucas, another among the Santa Barbara islands or off San Diego, while the main body of the fleet should be either at San Francisco or in Monterey bay.

San Francisco should be completely fortified and defended, so as to leave our fleet entirely independent to go out of port; and form at sea the first and exterior line of defence. The harbor can be defended by a proper arrangement of land and floating batteries and by movable torpedoes and torpedo boats of various types, leaving the fleet free to act upon the offensive defensive position which is emphatically the one to be taken by the Navy.

I do not mean to exclude the Navy in its share of inshore defence of this and other ports; but this work should be in connection with the torpedo defence, the floating batteries and coast defence vessels, or manning the shore batteries duly erected and armed by Army Engineers. Even here the longshoremen and watermen should compose the forces under ^{none too many, at best} Naval command, leaving the Seamen pure and simple to man the fleet.

The great value of the deep bight, known as Monterey Bay in connection with any important naval operations bearing upon San Francisco can be seen by a glance at the map.

Our Pacific coast is singularly wanting in deep and secure harbors or even good bays and roadsteads for vessels of large size.

The harbors in and about Puget Sound, and the bays of San Francisco and San Diego are the only secure deep harbors on the coast. The anchorages about the Santa Barbara islands and in Monterey Bay are the only deep ones of tolerable security besides these harbors.

Monterey Bay is about 23 miles long North and South, has a depth of 9 miles and though entirely open to the Westward, there are fair anchorages afforded in Monterey harbor to the Southward, and to a less extent Santa Cruz harbor and Sanquel Cove to the Northward. As the worst gales along this coast are from the Southward & Eastward, the best anchorage afforded is off the barne of Monterey, in the Harbor of same name.

None a deep bight is found, clear of rocks and shoals, and with water ranging in depth from 4 to 30 fathoms with hard bottom. The anchorage is open to the Northward and Westward, the prevailing wind, but on the whole it may be considered as a roadstead well fitted for the use of a hostile squadron engaged in operations against the City, port and trade of San Francisco, whether these operations involve a direct attack, a blockade, or are in the nature of a cover

to the operations of a land force attacking or besieging this city and the peninsula upon which it is placed.

The Northern side of Monterey Bay is 65 miles south of the Golden Gate by sea, but the distance by land to the City following the lines of railroad leading from San Francisco to Monterey and Santa Cruz is much longer. This distance is about 120 miles, the time by rail being 5 hours and the contour of the country between this bay and San Francisco being rough and mountainous.

With cruisers stationed in and off this bay, between Point Conception and San Diego, and off Cape San Lucas, the approach of an enemy's force should be seen and reported, especially if a telegraphic cable line should be laid connecting the Santa Barbara group with the main land in the vicinity of Wilmington; and the Farallones, (rocky islets, 25 miles off the entrance to San Francisco) with the forts and land systems at Fort point.

If Monterey and Santa Cruz Harbors were fortified, which is not very likely as matters now go, the first thing for the hostile force to do would be to silence and capture these batteries and occupy the town. But if the American Naval force had the necessary strength, an action

with this force would first take place, if being prepared and duly notified it had discovered the whereabouts of the enemy and sought the engagement which would determine the control of the sea frontier and trade routes of the Northern Pacific. With a loss of this engagement, would cease our trade along the coast and would follow a general commercial paralysis on our Pacific coast, the smaller towns and harbors would be subject to capture or tribute and the enemy at leisure could blockade San Francisco or begin elaborate preparation for its attack by land or sea. The scattered remnants of our fleet would repair to that Bay and assist in its sea defense - If the landing of a force was proposed, it is probable that Half Moon bay situated at a distance of 18 miles below the Golden Gate would be selected for this purpose. This bay though open to the Southward would, if favorable weather were availed of, give the best landing place on the coast near San Francisco, as the bay is deep and has some landing facilities, while a road from here leads across a depression in the peninsula (nearly 2000 feet high) of San Francisco near this point. The railroad from San Jose and the shore of the Southern extension of San Francisco Bay could thus be reached if this place were not

defended on shore

A limited extent of agricultural country exists here. ^{and also near by the} Spring Valley reservoir ^{the principal} water supply of San Francisco.

An attack upon San Francisco upon the part of our greatest commercial rival, Great Britain would be based upon Esquimalt, and the first line of our naval defence would be in the vicinity of that port and the waters of the Straits of Juan de Fuca and ~~the~~ Puget Sound

As this base (Esquimalt) is but 700 miles from San Francisco Bay it would serve the purpose for ordinary operations in the nature of raids against shipping and minor towns or even for a naval attack in force intended to be of short duration. Operations from this base should be met by our first line of defence which should be all of our available naval resources upon the coast gathered in and about Puget Sound, and patrolling and occupying in force the Straits of Juan de Fuca to and including the canal de Juan de Fuca.

If the enemy is met there the fate of San Francisco as far as naval forces are concerned would be decided in these waters, knowing that the interest of San Francisco in fortifying Puget Sound and developing here a Naval

establishment and naval resources, is greater and more direct, than is generally supposed.

The Naval control of the Pacific coast having been determined by a defeat of the American forces near Esquimalt, the British forces would proceed Southward; and if the capture of San Francisco is intended, the secondary base at Monterey Bay would still be necessary for the full prosecution of that work. This always presupposes the defences of San Francisco to be in a fairly efficient condition. It cannot be admitted for a moment that the present condition will be allowed to continue for any great length of time.

I will not close the question of an offensive naval campaign against San Francisco without a brief allusion to the resources now existing on shore on the Pacific Slope for military defence.

It is estimated that at the present time the Pacific Slope, by which I mean only California, Oregon, Washington Territory, Idaho and Nevada has a population over 1,600,000. souls. As this population is largely masculine, it is not extravagant to say that 1 in 5 are arms bearing, this would give about 325,000. men available for home defence.

A liberal estimate would give to British Columbia our nearest neighbor whose strength ashore is (without counting) a population of 80,000 souls, giving in the same ratio an available force of 16,000 men for offence or defence. Whatever strength may come to this force from the Eastern and interior portions of the Dominion of Canada, from Great Britain or even Australia would be vastly over balanced by what we could readily receive from the Mississippi Valley or East of the Alleghanies. The means of communication would be far better for us than anything the Canadian Pacific could afford, as it is but a single line of rail-way nearing our border in various places and tapped also by branch lines from our territory making it easily reached.

Besides the great lines crossing the continent and the branch lines which will allow ready concentration among the Pacific States and territory, there is railroad connection between San Diego upon the South to Puget Sound upon the North, without a break except the ferries of the Columbia and Sacramento Rivers and even these can both be avoided by a detour. With this great and growing population and with our good communications, hostile operations against the United States upon

the Pacific Slope will necessarily be almost exclusively confined to coast operations by naval forces aimed at our sea ports for the control of our waters and their immediately contiguous territory; and against our seaborne trade and shipping. The English means of offence will be almost exclusively naval, the means of defence on our part must also be primarily naval, the principal ports being properly defended by fortifications, floating defences and torpedoes.

As a base for offensive operations in the Pacific Ocean, San Francisco stands as the very first in regard to its geographical position, back country, and resources for men and military supplies. It is lacking in its coal supply, which now comes to it by sea from British Columbia, Puget Sound, Australia, the Atlantic Coast or England.

With the naval preparedness in the hands of an enemy in the North Pacific, the supply by sea would be cut off, and the supplies would have to come from distant points in the interior or by rail from Puget Sound.

Fuel being of such a bulky nature, the difficulty and inconvenience resulting from this manner of transportation, is at once evident

In case of war with Great Britain, almost our only source of supply on the Pacific coast would be from Puget Sound with the chances of such naval ascendancy on the part of that country as to practically forbid sea transportation of coal to San Francisco. The great inconvenience and loss occasioned by the cessation of the coal supply by sea to San Francisco points somewhat to the disaster that would result from the paralysis of the sea trade from San Francisco. It shows the great importance of having not only a naval force of sufficient size upon that coast, but the necessity of having a number of vessels held in reserve in ordinary at that point. These should not only not be of obsolete type and out of repair, but should be the very best of their kind. In the same way the Naval Arsenal and Dockyard at Mare Island should be completely fitted up with ample and modern appliances of all kinds. The time for considering this Station as an outpost to receive attention when all other Navy Yards are properly equipped, has passed away, and Mare Island should be no longer the dumping ground for obsolete stores and machinery. Of all the Naval Stations of the United States this one, from its importance and more especially, from its distance from

the manufacturing sources of purely naval supplies should have first of all, full amount in store of all necessary supplies.

Aside from the question of coal and defences San Francisco then stands first of all in every respect among the Naval Stations of the Pacific. Sydney is better placed as to coal and defences, but inferior in every other respect. Esquimalt is better off as to coal but inferior in all other respects. Tahiti is inferior in every respect.

Geographically San Francisco is better placed than Esquimalt being nearer the Hawaiian Islands the key of the mid-Northern Pacific and nearer to Panama and the Central American Canal the other vital points of the Northern Pacific.

The second city and port upon the Pacific Coast is Portland in Oregon, but this is badly placed on the Willamette river, a branch of the Columbia river.

The Columbia river, with the limited depth of water in its bar, and with its dangerous approaches and channels, would not be a good base for naval operations. For the same reasons it would be subject to attack only by the lighter vessels of an enemy and after the lights are out and buoys removed.

The defence of this river could be effectively made by batteries and torpedoes

The water area in the chart before you (No. 684 of the Coast Survey publications) shows the most probable theatre of Naval war in case of a conflict occurring with Great Britain. Vancouver's Island is so placed as to have been aptly compared to a spear head thrust at our North Western frontier.

The water space surrounding this spear head and the waters generally known as Puget Sound will now form the subject for examination.

This water area can be sub-divided into three parts, 1st the Strait of Juan de Fuca, 2^d Puget Sound and 3rd Washington Sound and the Gulf of Georgia

The Strait of Juan de Fuca, which is the channel by which the two latter divisions are reached from the sea is 95 miles long with an average width of 11 miles.

In this strait are found the first anchorages for large vessels north of San Francisco. The nearest bay to the Southward on the coast of the United States being Grays Harbor 105 miles to the Southward, which has a shoal bar forbidding an entrance to vessels of large or even moderate draught of water.

From cape Flattery to the southern shore of Vancouver Island, the distance is 120 miles. On the American side of the Strait outside the waters of Puget Sound and its entrance are three bays or harbors capable of taking large vessels and known as Neah Bay, Port Angeles and Port Discovery. On the British side within the straits are found the deep harbors of Port San Juan, Look Inlet and Basin, Becker Bay and Esquimalt Harbor. The strait proper is very deep, clear of shoals and obstructions and with a clean bold shore line existing at almost every place on both sides. Topography of both sides see page 182 Coast Pilot.

Of the harbors on the American side Port Discovery is the only one, whose naval value makes it of importance and its strategic value is very local and mainly in connection with the defence of Port Townsend and the water approaches to Admiralty Inlet and Puget Sound. Neah Bay, a short distance inside of cape Flattery has been proposed as a fortified harbor of refuge and rendezvous for our cruisers. The bay is small and not thoroughly protected from the wind.

and sea, and its use as a harbor of refuge for
stress of weather would involve the build-
ing of a breakwater and other harbor
improvements. The increase of trade to
and through these straits and to Alaska
may warrant these improvements in
the future.

As to the project of making this bay a fortifi-
ed harbor of refuge in case of war, I can
but echo the words of General Duane, late
Chief of the Engineer Corps in the army, who
says in this connection in a late report that
"It is believed that the conditions of the
present day are unfavorable to any such
fortified positions exterior to Admiralty
Inlet. The mercantile marine will not seek
our ports in that region unless our naval
force prevails, in which case it would have
no need to seek a harbor of refuge. Besides
with the exception of Port Discovery, there
is no harbor on the strait of sufficient
extension inwardly to shield vessels from
the range of modern armaments, and no
attempt would be made to reach Port
Discovery from the sea, unless the attainment
of Admiralty Inlet were equally
sure."

On the north side of the Straits of Fuca the harbors are of little value for naval purpose and of moderate value only for refuge ~~water~~ until the last and innermost is reached that of Esquimalt.

The Strait of Fuca from its width is incapable of being controlled by fortifications on either side of the channel, and vessels or squadrons can be refused entrance or departure only by Naval forces. These forces will have to be seagoing in every respect. With these waters held by an English fleet, all means of reaching the sea from Puget Sound will be denied us. With this Strait in our possession the ordinary means of reaching the sea from British Columbian ports would also be closed; but unless the Gulf of Georgia and Washington Sound were also held, the sea could be reached by the inside channel from the Gulf of Georgia, north of Vancouver Island to Queen Charlotte Sound. This is a longer and more tortuous route but practicable for the largest vessels.

Puget Sound, is situated entirely within American territory, is deep with bold shore lines, consisting of bluffs from 50 to 500 feet high and nearly 1600 miles in length.

The range of tide is great, differing in various

parts, but averaging about 14 feet. It has fine harbors both for mercantile and naval purposes, and it is capable of strong defense in various places. It is singularly rich in what may be termed unworked naval resources, such as ship building timber, fair coal for steaming and ~~cooking~~ purposes, iron ore and limestone. It has railroads built and building that give it after San Francisco, the best railroad facilities upon the Pacific coast.

From its combination of good ~~cooking~~ coal, iron ore and limestone within 50 miles of tide water, it presents advantages for the manufacturing of iron and steel, that no other place in the United States can equal.

Its possibilities for iron and steel ship building in the immediate future are very great. As it offers the only adequate and secure harbors, besides San Francisco, for the very largest class of war vessels on our Pacific Coast, it is not only eminently a fit place for a Naval Station, but it is susceptible of an attack from the most powerful hostile squadron. With the country immediately bordering it Puget Sound forms a mountainous basin, isolated from the rest of the territory by the Cascade mountains and the Coast Range.

To its value in furnishing secure harbors, and as the natural terminus of the Northern and Canadian Railroads, is added the great naval value, though unworked, of its resources, making it to an enemy like Great Britain, a rich and tempting prize, subject in war to attack. For the purposes of repelling such an attack, it now has no ready naval resources available, no fortifications, no ordnance afloat or ashore, and a garrison of one small company of Infantry quartered in barracks at Port Townsend near the entrance to the Sound.

Lecture 8.

Strategic Study of the waters of Puget Sound and those adjacent to British Columbia, with a general examination of the strategic conditions and possibilities of the Pacific.

As Puget Sound presents so many advantages as a site for a Naval Station, it will be well now to examine the necessity for such a station at this place, and the ^{strategical} importance these waters will possess when a properly equipped dockyard is established.

Such a station will be the source for supplies and the place for refit, and repair for all vessels engaged in cruising in Alaskan waters. A Naval force is necessary here for police purposes in time of peace, and in time of war would be especially essential in keeping up communications with our Alaskan coast, without dealing with the questions of its defence and protection.

The highways of this territory are waterways, and the climatic conditions are such, that the future development of this country will be, and close to the coast line and among the islands off the coast. The nearest available point to these waters for a Naval Station will be Puget Sound,

and vessels from Alaskan waters, should find refuge and resources there, instead of being obliged to seek a Naval port 700 miles farther to the Southward.

We are now separated from this portion of our domain by 500 miles of water navigation and by territory belonging to the strongest Naval power of the world. If we should be at war with another country besides Great Britain, we could not expect in the light of our past experience, much benevolent neutrality in the ports of our neighbors in British Columbia.

Whatever Naval force should be needed in connection with the defence of the mouth of the Columbia river, would proceed best from Puget Sound, its harbors having more advantage from position than any other, while the necessity of a naval station close at hand for all naval operations in the very important waters of the Strait of Fuca, Washington Sound or Gulf of Georgia, is obvious to the most casual observer.

I will endeavor to show elsewhere the necessity of some naval co-operation in the defence of these waters, a defence necessary and proper from the intrinsic value alone of the rich commercial resources existing

upon their shores and in which are found already towns of importance, increasing in number, wealth and population with rapidity.

Finally a Naval Station is required here for the strategic purpose of counteracting the Naval base and station of Esquimalt, whose very existence and resources are menaces to our interests in this part of the coast and Pacific ocean.

Let us now examine the question of the immediate defences of Puget Sound.

There being no fortifications existing there now, and no ordnance ready for the armament of ~~any~~ works if they should hastily be thrown up, it can be said with safety, that if war were suddenly to occur, the only defence available for these waters would be a Naval one. This would draw the naval forces to these waters, or if they should follow a hostile squadron going from Esquimalt for the purpose of operating against our trade, our coast or our other ports, Puget Sound would be left entirely unprotected in case of sudden return or appearance of the enemy, and be easily captured.

Fortifications properly armed with modern ordnance should be provided for

these waters at once, and though in my opinion the assistance of some naval force would be needed to co-operate in the defence, this force required would be very much smaller, while the land defences alone would retard the enemy so as to give time for the return of our main force. So far as the question of fortifications has been considered in connection with Puget Sound, it may be stated that the last official declaration upon the subject foreshadows the scheme to be as follows: Two lines of defence are projected. The first and principal line is to consist of works of great strength, armed with powerful modern ordnance, to be placed at the entrance to Admiralty Inlet on three points of land, Point Wilson, Admiralty Head, and Marrowstone Point. The least distance between these points is about 4 statute miles; the depth of water in mid-channel, ranging from 24 to 103 fathoms; there are no shoals, islands or obstructions, and the shore line is bold and clear. Point Wilson is 200 feet high, ~~and~~ Admiralty Head 80 feet, and Marrowstone Point ^{at height.} 160 feet. At the foot of Point Wilson is a low sand spit, which could be used as the site of a battery or turret and prevent a vessel getting under guns of the

upper work. In addition to this line of defence, a second line is proposed, consisting of earth works just North of the town of Seattle and also at the Narrows. The proposed Naval Station would ^{not likely} be within the second line of defence.

Puget Sound has another entrance at Deception Pass; this is narrow with a swift and difficult tidal current, somewhat dangerous even for steamers and its defence would be a simple matter aided as it could be by submarine mines or other obstructions, as its narrowest width is but 150 yards.

To return to the question of the first line of defences - The least distance between the points ^(Pt Wilson, Maniwash Point, Admiralty Head) being about four Statute miles, vessels in mid-channel are exposed for a distance of four miles only to a cross fire from the works upon the three headlands named. During that time they would find the mid-channel the least dangerous ~~place~~, both before and after reaching the cross fire, and the vessels could possibly regulate their positions so as to be a little beyond 2 miles from the fire of each work.

In broad daylight these vessels with speed from 12 to 20 knots would be exposed for a period

of time ranging from 20 to 12 minutes, without
 counting the rapidity of tide which exists here -
 From the depth of water no mid channel fort
 is possible, and this ^{great} depth, in connection with
 the range of tide and ^{rapidity of} current would make an ^{if not impossible -}
 torpedo defence also difficult. Considering
 these circumstances it would seem even under
 the most favourable ^{circumstances} ~~time~~, that the aid of float-
 ing defences would be ~~necessary and even~~
~~essential to success.~~
~~present.~~

It has been summed up as a total experience
 of our civil war that in no instance, where a
 chain ^{sufficiently} was ~~deep~~ and unobstructed did a
 naval attack and passage of forts entirely
 fail. Here is a state of affairs existing that
 prevents a closing of the channel and to the
 facilities afforded the offence in day time
 by smoke and tide, will be doubtless added
 the advantages offered by ^{the} thick and foggy weather
 which is not infrequent here. A night attack
 or rather a night passage could be effected
 there being no shoals or natural channel
 obstructions. On account of the ^{various} circum-
 stances, naval aid to a complete defence of
 this entrance seems ^{imperative} ~~necessary~~, and the entrance
 once ^{passed} ~~effected~~, naval defence ~~remains the only~~
~~and more~~ ^{possible} ~~necessary~~. This defence need not be from
 vessels especially built for this purpose, the

depth of these waters allow the use of ordinary
seagoing armored vessels of any draught or size -
Port Townsend just inside the entrance to
Admiralty Inlet is separated ^{from} by Port Discov-
ery to the Eastward by a tongue of land
over 2 miles wide at the narrowest part -
The defences of the entrance to Port Discovery
should be included in those of Puget Sound
and require ~~the~~ the presence of Naval forces
with perhaps a fortification upon Protection
Island. If the enemy's fleet runs past the forts
and anchor in Oak Bay overland communication
on their part with Port Discovery or
Port Townsend, if either were in their posses-
sion would be ~~both~~ passible and valuable

It is my belief as elsewhere stated that in
case of war with Great Britain, the theatre
of Naval war in the Pacific will be here.
It has been well said that in case of war, the
fighting should be at the frontier, it being
more natural and simpler, as well as nobler
~~to~~ to meet an enemy at this point.

We should have our strongest naval forces
concentrated at these points for purposes of
the defensive and for the purposes of that
offensive, which the genius and spirit of
our people naturally desire

As our Naval forces are increased, those of the Enemy can be held in check entirely; and it follows, that any operations on his part elsewhere in the Pacific will be made improbable or impossible.

The enemy's force or fleet should be the objective point of a purely defensive campaign as well as that of an offensive one.

It is almost if not quite an axiom in war, that in defence, the destruction of an enemy's force is as vital to the end sought as it would be in an operation for offensive purposes alone. To accomplish the destruction of this naval force we need not only a force large enough in numbers to meet any fleet Great Britain would be likely to assemble here, but, ^{also one} including battle ships, carrying ordnance of large size and modern construction and protected with heavy armor. We might not find the very heaviest of England's armored vessels in these waters, but we would find armored vessels in strength and protection beyond anything that we now have, or anything authorized or proposed.

No matter how brave and efficient our officers and men will be, a loss of moral force is inevitably connected with the consciousness of inferiority in force, in protection or in the

number of vessels. The spirit of courage is transposed to ~~soul~~ be simply an endurance of a cruel punishment.

The communications by rail from Puget Sound consist of a line from the Columbia river to the Southward, connecting with a line extending to San Francisco and having terminal points at Olympia and Tacoma.

The Northern Pacific proper now piercing the Cascade range by a tunnel, reaches Tacoma from the Eastward, while a branch line extends to Seattle. A railroad is to be built from Seattle to the Northward connecting with the Canadian Pacific at Vancouver in Burrard Inlet and passing through New Westminster, making Puget Sound another terminus of the Canadian Pacific, and connecting that railway with the railways leading to San Francisco. It is probable that the Manitoban & Northwestern railroad will also reach Puget Sound in the future following a line between the Northern Pacific and the Canadian border. A railroad is also proposed on the west side of Puget Sound to Port Townsend. The third division of the water area before us is the most northerly part and includes Washington Sound with its Archipelago and the Gulf of Georgia. The most important

points here are Vancouver and Burrard Inlet
the present terminus of the Canadian Pacific
Railroad, Nanaimo the great coal port of British
Columbia and the islands and harbors belong-
ing to the United States in Washington Sound
between the Canal de Horn and Rosario Straits

Vancouver is a town of a very short existence, having
~~several thousand inhabitants and~~
~~but~~ beds fast to be a point of consequence and
the principal town in British Columbia.

In case of war this port and the railway of
which it is the Pacific terminus would
be the principal source of supply to the
English naval and military forces on the
Pacific, for almost every thing except Coal
and ^{fresh} provisions. It is the great military
highway of British America with the fort-
ified Naval ports of Esquimalt and
Halifax at either end. Its utility for the
purpose of furnishing warlike material
in time of peace was very early demon-
strated, the Canadian representation to the
late Colonial Conference in London stating
that the first through train ever run over the
Canadian Pacific, weeks before the Railroad
was opened to the public, was one carrying
stores and supplies to the English fleet at
Esquimalt.

From Vancouver steamers are now plying

to Japan and China, effecting a saving, it is claimed of 600 miles in distance and 2 to 3 days in time, and it is probable a line will soon be running to Sydney and New Zealand. The distance from London to Sydney via Vancouver is 12,811 miles of which 3,271 are land miles, while the distance from London via San Francisco to Sydney is 14,895 miles of which 3,300 are land miles. The distance is in favor of Vancouver and the Canadian Pacific, and the time would be also, if New York was used by the Canadian Pacific Railroad, as its terminal port for steamer connection.

The use of Halifax or any other Dominion port for steamer connection will not afford as rapid a passage to England, as no matter how highly subsidized and rapid the English steamers from Halifax may be, the frequency and rapidity of the sailings from New York cannot be equalled.

The distance from London via Suez to Sydney is 11,533 miles, and the continuous water route and avoidance of transhipment will make this route the best for freight, supplies and certain class of passengers. Besides freight trains would rarely make rapid time and the time saved by a rapid

transit by rail across Canada would only be of value to passengers and mails.

I do not anticipate any great results to follow from this rail and steamer route to Hong Kong or Sydney. Even English writers of authority upon such matters maintain the superiority of the route via the Cape of Good Hope to China, as well as that of Suez Canal over this route for general trade purposes.

While I do not anticipate any great or successful rivalry on the part of Vancouver with our principal Pacific ports and while I also believe that the Canadian Pacific will depend principally upon the United States for its most important and profitable sources of trade, there is little doubt but that the completion of this railway has had a strong effect upon the military and political situation of British Columbia. It has ended its political and military isolation, brought it nearer to England and the more thickly settled parts of the Dominion, and made the Naval port of Esquimalt a very much more important place as a naval point for operations upon the Pacific.

Before this railroad was constructed all supplies not to be obtained in British Columbia had to be obtained from the U. States

or by Cape Horn or Panama; the expenditure of £100,000
 in clearing & repairing us might have led ^{eventually} to an
 absorption by us, but this is now postponed.
 Through the instrumentality of the Canadian
 Pacific Railroad, steamer lines have also
 been called into existence, which will
 furnish vessels in time of war, that will
 be of service as transports and commerce
 destroyers.

For the reasons just given, Vancouver
 and Burrard Inlet generally, have be-
 come a place of strategical importance.
 The harbor made by this Inlet is good and
 deep, and the rapid current at the narrows
 is almost the only objection to be urged
 against this place.

Many officers of high standing in the
 English Service have urged the removal
 of the Naval Station to this place, but
 the completion of the dry dock at Esqui-
 nault, its proximity to Victoria the Ca-
 pital, the coal supply at hand, and the
 shorter distance from the sea have fin-
 ally settled this question ^{satisfactorily} in favor of
 Esquimalt.

On the opposite side of the Gulf of Georgia
 and nearly due west from Burrard Inlet
 at a distance of 30 miles is Nanaimo, the

port from which is shipped the best coal upon the Pacific coast. The mines are close by the town and also at Departure Bay two miles to the Northward. Coal found here is bituminous and ranks about the same as Australian or Sydney coal. ^{All} The coal obtained from Vancouver island was formerly shipped from these points, but recently a railroad has been constructed to Esquimalt, which will make it a coal supplying point. The distance between these points by rail is 100 miles and by sea about 85 miles.

The ~~plains~~ lands in Washington Sound of which the most famous is San Juan island enclose a number of harbors which are deep and commodious. The use of these or at least certain ones has been advocated for the purpose of forming a fortified harbor of refuge. The only use for this fortified harbor would be, to enable our forces to refit, ^{small merchantmen} or to evade a superior force, but Puget Sound and the interior waters would serve better, because of the secure and unattackable communications with the interior of the country. Temporary anchorages could be afforded here for vessels watching the harbor of Esquimalt, or the trade carrying down

from Burrard Inlet or Nanaimo.

It was supposed at one time that batteries upon San Juan island would cover and very effectually the Canal de Haro the principal approach to the Gulf of Georgia and its ports, but since the survey of the channels running close along Vancouver island, the value of fortifications for this purpose has been very greatly lessened.

Having made our examination of the waters bordering upon and adjacent to our Northwestern frontier, let us return to a closer study of Esquimalt harbor, the only Naval station of the English in the Eastern Pacific.

The harbor has an extreme length of two miles, one half mile in width, except just inside of the entrance where including fan-shape it is a mile in width.

There is ample depth of water for the largest vessel ranging ^{in the usual} ~~new~~ the anchorage grounds from 20 to 50 feet; in ^{30 feet M.L.W.} instance, ~~fan~~ there is ~~fan~~ a ^{30 feet M.L.W.} depth of ~~6 fathoms~~. The entrance channel is about $\frac{1}{4}$ of a mile wide, with a depth of water ranging between 40 and 60 feet, the mid channel being quite clear ~~with~~ ^{there are} some rocks and ^{and} sandy ^{bottom} shoals on the eastern side of the entrance.

An exposed anchorage Royal Bay and Roads exist outside, which would be unsafe in the South Easterly gales.

Upon the tongue of land to the Eastward of the entrance is the Naval Station and the Dry Dock 450 feet long. This tongue of land is low in places and would not effectually mask the vessels at anchor inside.

The only immediate defence now existing is an outer Batteries Island, a half mile from the anchorage in a direct line, and of course less from the dockyard. The fire upon the battery on this island would be in line for the Naval station and shipping inside. This battery with those on Macaulay Point and Beacon Hill are armed with ordnance of moderate range and of obsolete type, and must be considered as an inner line; the outer line of works as planned are yet to be built but contemplate a heavy cross fire at 1,000 yards with an armament to consist of four 9 inch B.L.R and two 6 inch B.L.R. 2 quick firing 9th guns, six 16 pdrs and six rifled machine guns. Two torpedo boats are now at Esquimalt of the ordinary Spar torpedo class purchased during the last Russian scare from the French.

In addition submarine mines are provided for harbor defence the armament just mentioned has been actually shipped from Great Britain but is not yet in place or arrived ^{See. 1888}

This naval station has two bearings upon the interests of the United States. It is but 18 miles from Point Angeles on our side of the Straits of Fuca, and but 30 miles from the entrance to Puget Sound. In the absence of a naval force, fortifications and Naval station on Puget Sound, it commands the entire water area under discussion, and the waters and shores of Puget Sound are now entirely at the command of any English military or naval force issuing from Esquimalt Harbor.

Its importance as a base of operations (if there should be no naval force of the United States in these waters) against the Columbia river, San Francisco and the Pacific coast generally is obvious, it giving the British fleet great power in keeping the sea in these waters, and furnishing to them an unlimited supply of coal, it would give all the advantages of the telegraphic and railroad communications, which the Canadian Pacific Railroad now furnished. It ^{would} prove also an excellent source of supplies.

and base for England against Russia in the Naval operations likely to become necessary in the future. The existence of this station in fact dates back to the last Russian war, in which England was engaged in, and arose from the naval necessities of the time.

In regard to the North Pacific generally the geographical position, resources and harbor, are greatly inferior to San Francisco, more especially with respect to the distance from the two great points in the North Pacific, the Hawaiian Islands and the American ship canal. It is also inferior in harbor communications, resources and natural facilities for defences to many sites on Puget Sound.

In any war between United States and Great Britain with the entrances to Puget Sound properly defended by land and water and with a naval force too weak for offensive operations, a land attack upon the Canadian Pacific to the Eastward and near Burrard Inlet would be most probable. A military force could be transported to Skagit Bay inside Whidby islands and by the aid of light draught steamers, the Skagit river could be ascended and made the base of operations against the Canadian Pacific Railroad, and

the Fraser river settlements. From the
^{thickly wooded} present condition of the country it is likely
 that this will have to be at first somewhat
 in the nature of a raid, to be followed ~~as~~ as
 roads are made, by more serious operations.
 All operations of this kind will be seriously
 handicapped by a want of sufficient Naval
 force to control the waters between Puget Sound
 and Burrard Inlet. When the railroad be-
 tween Vancouver and ~~Seattle~~ is built, New
 Westminster could be readily reached and
 permanently occupied and the Canadian
 Pacific seriously interrupted.

As Canadians in the East and Centre will
 naturally desire to occupy themselves
 with defences of their own banks, not much
 in the way of reinforcement from that di-
 rection or from England can be expected
 by the British Columbians and the mili-
 tary preponderance and resources will be
 greatly in our favor.

If our naval force should be equal or nearly
 equal to that of the English in these waters, an
 engagement should be sought and if our
 forces are successful the command of
 these waters will become ours, with probably
 the remnant of the enemy's fleet blockaded
 in the harbor of Esquimalt,

These vessels of our force not required for the blockade of Esquimalt will be free for operations against Burrard Inlet and Nanaimo. If both of these ports should be so fortified as to deny an entrance to the fleet, operations can be carried on against Burrard Inlet in connection with our military forces; the railroad between Nanaimo and Esquimalt can be cut and commanded, and Nanaimo taken by a detachment, landed at one of the coves to the southward in Steart Channel, at a distance of only 5 miles. With these places in our control and with the surrounding waters in possession of our Naval forces, the fall of Esquimalt becomes but a matter of time. The cable communication to the Mainland would be cut at once at either Point Grey south of Burrard Inlet or on the Nanaimo side and the vicinity of Esquimalt affords many places suitable for landing all the way from Pooke Inlet to Saanich Inlet.

If Nanaimo and Vancouver ^{were} undefended, and our naval naval force was not able to bring about an engagement, raids could be made by vessels, (masking their movements by the San Juan Archipelago,) upon Nanaimo and its coal wharves and Vancouver and its

railway.

Should the Naval force of the enemy proceeding from Esquimalt evade our naval force and go to sea, we could follow along the sea coast to the Southward, keeping up communication with various points and life saving stations and ascertaining at what point of our coast the enemy is sighted. Of course under these circumstances, Puget Sound is considered to be with sufficient defences and with ample land forces at command, or if reasonably sure of our Pacific coast, an attack might be made at once upon Esquimalt, landing some of our surplus military forces if circumstances would justify, by the aid of the numerous craft already existing in the waters of Puget Sound.

In the absence of the enemy's fleet by decoy or otherwise would also give opportunity for rapid attacks or raids upon Nanaimo and Vancouver.

The absence of ^{the} fortifications that will be ~~at~~ the outer line of defence of Esquimalt, prevents us from discussing a proposed attack upon that port. With the present inadequate works, ^{thus} the defence of the harbor will be almost exclusively a naval one.

Having — finished our examination ✓
 of the North American coast of the Pacific,
 with a view to strategical possibilities, we
 will now turn to the broader field of the
 whole Pacific, and commence with a state-
 ment of the material conditions and naval
 resources of the leading Nations, whose
 territory exists on that ocean.

Of the general importance of the United
 States and its Pacific coast line, there is
 little more to say. Its development and
 progress upon that ocean far exceeds that
 of any other Nation, and is approached only
 by Australia. It has on the Pacific slope
 a territory, daily becoming more and more
 closely bound to the central and Eastern
 sections, possessed with wonderful re-
 sources and capable of sustaining a popu-
 lation of 50 millions of people. Its principal
 port is the greatest in the Pacific and among
 the very first in the United States. Its sea
 borne trade already great is sure to increase
 greatly in the future, and as a naval port
 with the resources behind it, a moderate de-
 velopment alone is needed to make it the
 first in the Pacific ocean. With so much
^{harbor} water area, there is little probability of any
 clashing between the commercial and naval

interests of this port.

It is now the only naval station of the United States upon the Pacific, but soon to be supplemented, it is expected, by one upon the shores of Puget Sound.

The United States have the best position upon the Pacific as a whole, in regard to future and material resources, and pre-eminently the best upon the Northwestern Pacific. She has however no insular or South-eon possessions upon that ocean, and consequently her command as to the entire ocean is limited ~~and~~^{to her coast line}. In a military or Naval sense Alaska would be a source of weakness rather strength. Her relations with the Hawaiian Islands are such however that she cannot afford to allow any other nation to possess this group, which being destined to be great cross roads of ocean highways becomes^{will} a commanding point with respect to the trade of the Mid-Pacific of the North.

The natural rivals of our country in trade, England and Germany may become enemies in war, and Cuban matters may make Spain a maritime enemy, while the Panama canal presents difficult problems with France. As allies we might probably have Russia and our relations with Japan^{fast} becoming

a Naval power of rank, ought always be of the friendliest nature.

Great Britain has her foothold and Naval Station at Esquimalt, which we have discussed, she has also in the Southwest Pacific a still more valuable Naval port in Sydney in Australia, ^{which} strongly fortified, has a magnificent harbor, a large commercial port with fine graving docks and other naval resources including coal mines near by.

New Zealand to the east of Australia also possesses some fine harbors, several large graving docks and an excellent native coal supply with other naval resources of less value and in less degree. Its ports have been but recently fortified.

In the North Western Pacific, Great Britain has as its nearest Naval station Hong Kong, upon the China Sea, about the same latitude as the Hawaiian group but far to the Westward. The fleets from Hong Kong and Sydney could unite and with the natural barrier, formed by the Malayan Archipelago, be a serious obstacle to an approach towards British India from the Pacific.

All of these ports mentioned besides being

the headquarters, each of a strong squadron are either now, or will be provided with armaments and fittings for converting a number of merchant steamers into Cruisers. A gap exists in the Southeastern quarter of the Pacific for Great Britain, which is not filled by the Falkland islands.

England here has a friend however in Chile and coal can be had in abundance.

Great Britain has then the best general naval position as to the Pacific and is 2nd in material resources.

If France should take upon herself as a passes-
sion the Panama Canal, she would besides
a strong strategic position, have a fine
position for a Naval Station. At present
she has only the Naval Station at Papeete in
Tahiti, the headquarters of the French
Naval Division in the Pacific. This
station is wanting in the first requisite
of a Naval Station, a Dry dock. It has stores
of coal, a small marine railway ^{repaing} plant and
is fairly well fortified.

New Zealand an important presents some
fine harbors, but little else.

Germany has recently acquired posses-
sions in and about ^{W.W.} Guinea, and also a
protectorate equivalent to a possession of the

Marshall and Brown Islands. At Jaluit in the former group is established a naval and mercantile coaling station. This is however not fortified, and without further resources. The Samoa group presents more available places for coaling and naval stations and may be in time used as such by the Germans. If Germany should ever incorporate the Netherlands into her home empire, she would acquire valuable colonies in the Malaysian archipelago, which would serve as naval centres near the western Pacific, all however insular in nature.

Russia has in Vladivostok a naval station which is strongly fortified, with docking facilities, and other naval reservoirs, but which is closed three months of the year by ice. When the transcontinental line is finished across Siberia, which is ^{now} expected to take place in 1893, Vladivostok will be but 20 days from Saint Petersburg by rail.

Spain has her territory in the Pacific in the extreme western part in the Philippines, Ladrone and Caroline Islands. Her naval and mercantile centre is at Manila, though the Caroline Islands afford some excellent harbors especially

at Yap. Her naval forces and resources are however meagre in these waters. Of the nations not European, the Japanese are strongest in Naval Marine, possessing excellent and modern ships of various types, and also docks, dockyards and a good plant for repairing vessels. Her naval resources in respect to ~~dockyards~~^{coal} are good. It is not probable except as allies that their operations will extend to the Eastern Pacific. Her population of 40 millions of people must count in the future as an element in the

Philippines has a small but efficient naval marine and with a territory bordering the Pacific from 18° to 55° of South latitude, a distance of over 2200 miles, will continue to be a sea going nation. She lacks a dockyard, and has no docking facilities for her larger frigates. This is likely to be remedied in the future by the establishment of a dockyard at Tullcaneano. The points whose geographical positions or Naval resources make them valuable strategical points in the region of the insular Pacific, would be the Hawaiian group, Tahiti, the Galapagos Islands, the Samoan group, and a good harbor & island

either in the farolines, Marshall or Gilbert groups. The Fijis are valuable to England, as is Thursday island* in Torres Straits. Some of these are already coaling and naval stations, while others are likely to develop in that ~~way~~ direction.

Before discussing in a general way the elements that will be most likely to enter into what I may be allowed to call the naval campaigns of the Pacific, let me call your attention to some important matters in this connection.

Modern times and modern Naval Construction have brought new considerations to the front in naval warfare. Among the most important are the questions of speed and sea endurance. These in turn involve the question of fuel, and the question of docking and repairing facilities. The complicated machinery of a modern war vessel no longer confined to the propulsion of the vessel alone, involves the question of the facility for repairs and for the duplication of parts of machinery partially or wholly disabled. The first want, fuel, must be supplied by a coaling station, the second, repairs, by a Naval Station and Dockyard.

The limited capacity left in a ship for torpedo and gun ammunition and for other supplies, involves the question of a supply depot, which want is met by an arsenal, which can be and generally is united with the coaling and naval station.

The Naval Station being the greater includes the other requirements and must not be very far off in a naval campaign. It may not be the nearest base, but it must be the home base from which the naval force primarily starts and to which it eventually goes.

A Naval Station can then be defined as a place d'armes for strategic purposes, a port for the repair and equipment of vessels of war, a depot for troops, stores and provisions, and a harbor of refuge for the naval and mercantile marine, when pressed by an enemy. It should be well defended and capable of standing a siege until the arrival of a fleet.

San Francisco, Esquimalt, Tahiti, Sydney, Hong Kong, Yokohama, Vladivostok, and possibly Valparaiso represent to a greater or less degree the Naval stations upon the Pacific.

A coaling station, in a naval sense is a place for replenishing Naval & Mercantile

vessels with coal, stoves and provisions, it should be fortified sufficiently to afford refuge from the enemy, to deny an anchorage to vessels of an enemy and to prevent its destruction or occupation by a hostile squadron.

We may cite San Diego as the nearest approach to a coaling station of this kind that we have, while England has Brisbane, Melbourne, Hobart, and Auckland with other places in Australia rapidly becoming capable of a classification under this category. France has Noumea in New Caledonia, while Spain has Manila.

In fishing and Naval stations the fleet should be left free to make any movement necessary for naval purposes, including protection of commerce, without having the defence of the station dependent upon it.

The rapidly lengthening sea endurance of the latest vessels requires fewer coaling and naval stations than were formerly considered necessary. This increase has been rapid of late from the Sfax and Esmeralda, each with an endurance of 6,000 knots at 10 knots an hour to the Giovanna ^{Piemonte} Bausan, and the Reina Regente with sea endurance of 12,000 knots and over,

at a moderate speed. For active and immediate warfare the high rate of speed alone should be considered as a basis for calculation, but the distances between coaling stations can be increased by the possibility of modern vessels. The ~~consideration~~ of loss of sailing power being compensated by the additional propeller and increased coal endurance of the vessels of the present day.

The Naval operations in the Pacific Ocean which from the extent of military and naval forces employed; length of time spent; elaborateness of preparation made; and importance of object aimed at, can be styled Naval campaigns, are as yet few in number.

We may mention as the principal ones, the control of the North Pacific; the control of the Mid Pacific possessions of France, operations against Australia or New Zealand; or others against the territory or ports of one of the nationalities of the West coast of South America.

There are possible campaigns against Chinese or Japanese ports, including Hong Kong, and against the Phillipine Islands, but they can not ^{in this paper} be discussed or even examined in the most cursory manner. The control of the North Pacific Ocean means first of all the control of Esquimalt

if great Britain is an enemy, and after
that, the control of the Hawaiian group.
This group is geographically midway be-
tween the East and Western shores of the
Northern Pacific. It is the natural port of
call between the North Eastern and South
Western Pacific, and the midway point
on the route from the future ship canal,
Japan, China and Russian Asia.

A radius of about 1600 miles from Hono-
lulu will reach the route of the China
trade from the west coast of America,
the trade to Australia from the same coast
(if it should avoid this group) the trade from
the canal to the shores of Asia, and the
German, Spanish and Dutch possessions
in the Western Pacific and the Malay-
Sian archipelago. As there are no fortifi-
cations at any of the ports of this group,
a naval demonstration upon our part,
made at once, would give us the control
of this group, which in case of war with
another power, would readily become a
bone of contention.

Honolulu is naturally the central point
to be obtained, the larger vessels being
obliged to anchor outside, on account of
the limitations of the depth of the entrance

channel. The extreme islands of the group, Maui and Lanai, have open bays at Hilo and Hanalii which would afford refuge and anchorage for vessels of a squadron intending to operate against the Naval force in the vicinity of Honolulu. Rapid cruisers could be stationed in these ports; and by a patrol between them or by a chain of telegraphic signals, information to Honolulu could be conveyed. It is evident that promptness is needed in any naval operations concerning this group as the first nation having naval predominance in these waters has decided advantage, the following Squadron arriving necessarily after a long passage and needing coals and supplies before being ready to give or receive action.

The Hawaiian group, once permanently in our possession, the fine harbor of Pearl River should be opened, developed as a coaling and naval station, and fortified as a harbor of refuge. Military forces garrisoning this place; and Honolulu being duly defended we could hold the Island of Oahu, which is all that is necessary for naval purposes and as a refuge for mercantile marine. The Naval Control of the North Pacific

means then first of all, a blockade or other control over Esguinealt and its waters, a naval predominance on our own coast and possession of the Hawaiian group. Operations against the French islands of the mid Pacific would find as the ultimate object the possession of Tahiti and its naval part of Papeete. A squadron proceeding from the Hawaiian islands, would find a convenient point for a rendezvous and base in the Marquesas islands. If we had a naval station or port in the Samoan islands, that point would naturally be our point of operations, though it is to the leeward of the Society group. With no foothold in Samoa, the Marquesas group would be the best point from which to attack, and the Island of Uukahiva and the bay of Anna Maria, used in war of 1812 by David Porter, would be found the most convenient harbor. From here to Tahiti the distance is about 700 miles. An attack on Papeete would best be in the nature of a flank attack, there being accessible anchorages and inside channels to the southward, between Point Venus and the harbor. A force could be landed and a direct attack upon and exposure to the principal battery which is elevated, could be thus

avoided. The French control of the Mid Pacific hangs upon the control of Tahiti, no other place being fortified. For any continued operations the long distance of any French home port from Tahiti would be in our favor, the excellent port of Noumea, in New Caledonia could be used, though it would labor under the disadvantages of being to leeward and with few naval and material resources. An attack upon Noumea itself could be based upon the Samoan group.

In considering naval operations against New Zealand and Australia, we will examine the question as a whole at first, and then afterwards discuss the ports.

The Australian colonies of Great Britain are already rich in resources and great in trade. With the consciousness of the strength of Great Britain behind them, they are to-day the most aggressive people in the Pacific. Great Britain, through its prevailing government seems principally occupied in holding them in check.

They are as yet without any federal or federated government and subject to local jealousies and rivalries and ^{the} general defects arising from ~~of~~ a want of union.

England has a trade with Australia

amounting in round number to over ~~up~~ 50 millions of pounds, while recent estimates give to Australia and New Zealand a mercantile marine numbering about 2,800 vessels, a tonnage in the vicinity of 375,000. and a population of 3,600,000. The self-reliance of these colonies can be understood, when I state that one of them, New South Wales has expended nearly £2,000,000 upon the fortification and defences of Sydney alone, which has a population of 375,000.

The demands upon the Home government from these colonies, accompanied it is fair to say with liberal opponents on their side, have been such, that a local Australian squadron is being provided for these coasts by the joint efforts of the Australian colonies and Great Britain, which will be in addition to the regular Imperial naval force ~~now~~ stationed in these waters.

The objects of this Squadron are announced, as
1st To provide a defence against attacks from Ironclads with ships of equal and greater power
2nd To provide for the defence of commerce by cruisers of the latest type
3rd. To have in reserve in the colonies, in the older Corvettes, Officers and crews, to man the mercantile cruisers which would be

employed in time of war.

~~likly~~ to carry out the police of the Pacific. A comparison with Great Britain in the Naval Australian policy and the United States in the habitual absence of national war vessels from our ^{over}Pacific Coast shores shows that Great Britain is bent upon taking every opportunity for acquiring and retain a maritime and naval preponderance in the South Pacific, which we would do well to emulate in the North Pacific and Pacific Coast Squadron.

The most important strategical position in New Zealand, is the port of Auckland, while Australia proper, Sydney on the east coast, Thursday Island off the North coast and King George Sound on the South West coast rank as the most important in a strategical sense; Sydney of the four stands highest, as with a fine and well defended harbor and good naval resources, it unites commercial and political importance and excellent geographical position.

Thursday Island besides being an available Coaling Station has a commanding position with respect to Torres Straits and its trade and one way to India.

King George Sound is the most available

harbor for coaling, and for a base of operations in the South West coast of Australia for vessels of an enemy coming from the Eastward.

Any naval operations against New Zealand would naturally be directed first against Auckland on account of its fine harbor and strategical position.

The Samoan group is the nearest available base of operations that we would likely to use, the distance being about 1600 miles from Auckland. It is only within the last few years that Auckland has been at all fortified and with a moderately strong force it could be taken and held until the combined Australian squadron should appear; single vessels, unarmored, could be dented anchorage but could find in the Bay of Islands a temporary rendezvous for operations against the shipping passing ~~through~~^{near or} Cooks Straits. Port Lyttelton and Port Chalmers the sea ports of Christ Church and Dunedin on the Eastward, are the most important ports upon the Middle Island, and besides being ports where considerable shipping could be found, possess excellent graving docks. On the West Coast of the Middle Island at Westport, and in the vicinity of the Grey

river, most excellent coal is mined and shipped and a destruction of the coal shipping facilities would be a serious loss to the colony.

An attack upon Sydney in Australia must be a ~~very~~ ^{formidable} one, as the harbor is strongly fortified, and in addition a strong naval force is sure to be met with here ~~in~~ ⁱⁿ ~~more or less strength~~. Some point held in New Zealand like Auckland or the Bay of Islands would be the best base of operations against Sydney, the distance being less than 1,200 miles, with chances of bad weather and unfavorable winds in these localities which make the matter of good coal supply of more than usual consequence. ~~in the winter~~.

There are two places in the vicinity of Sydney, Broken Bay to the Northward and Botany Bay to the Southward, which would afford opportunities for landing forces intended to operate against Sydney. Newcastle the great coal port of Australia is just to the Northward of Sydney and has a poor harbor. The railroad connecting the two places is to cross the Hawksbury River by a large iron bridge, which could be destroyed by light dracrigit vessels.

The naval forces of Great Britain, which

would assemble in Australian waters must be met and defeated, before operations in these waters would assume a more serious nature than raids upon ports and against shipping. Vessels raiding in Bass Straits would find much shipping bound to and from Melbourne and by duey the two great ports of Australia. Vessels operating in the vicinity would find excellent harbours of refuge in D'Entrecasteau channel and at Port Arthur in Tasmania if they were not ~~strong enough~~ ^{with sufficient force} to enter the Derwent river and anchor off Hobart. Moreton Bay to the Nanticoor on the coast of Queensland affords good outside anchorage which could only be defended by naval forces. Brisbane up a river leading from this bay, is the capital and principal port of Queensland, and is made capable of a strong defence by batteries, torpedoes and obstructions, the channel being ^{an} artificial ^{one} and of limited depth. Melbourne and Port Adelaide are ^{strongly} fortified so that a mere raid on these harbors would not promise much success.

For operations against the West coast of South America, the most valuable base south of Panama, would be the port of Payta in northern Peru. From this place the whole of the present coast of Peru could be readily

and sufficiently strong defences and garrison
 to be independent of the aid of a naval force for
 the purposes of repelling an ordinary attack.
 Let me again call your attention to the fact,
 that there should be stations fulfilling these
 requirements at a point on the Central Ameri-
 can coast, either at Golfito, Tigre Island
 or Panama, for the general protection and care
 of our trade from the Atlantic and Caribbean,
 and especially the trade to the Northward.
 There should be such a station also in the
 Hawaiian group, for the protection of our
 China, Japan and South Pacific trade to
 and from California, and for the control
 of the Mid Pacific of the North. There should
 be another such station in the Samoan group
 as a point for the protection and refuge of
 our trade in the Western and Mid Pacific
 south of the Equator, and also as a base for
 any operations against the French and En-
 glish possessions in those waters.
 Finally there should be a coaling station
 in one of the Gilbert group, for the protection
 of the trade route from the Canal to the Torres
 Straits, and Spanish and Dutch East Indies.
 Three out of four of these stations are in the
 North Pacific, but at best three-fourths of
 our Pacific trade and interests will be North

of the Equator.

In regard to the necessity of fortifying these stations, let me close this paper by quoting as pertinent, the remarks of Admiral Wilson of the English Navy, upon this subject. He says - "There are it is true some coaling depots among the Western Pacific islands belonging to the Germans and Americans; but as these are quite unprotected by batteries and would at once be destroyed by the English Navy in the event of war being declared by or with the Nations to which they belong, they cannot be looked up as depots for war purposes."